大門　寛

学歴

1976 年 3 月　東京大学理学部化学科卒業
1978 年 3 月　東京大学大学院理学系研究科化学専攻修士課程修了
1983 年 6 月　理学博士（東京大学）

職歴

1978 年 3 月　東京大学物性研究所 表面物性部門教務職員
1983 年 3 月　東京大学理学部物理学教室助手
1990 年 3 月　大阪大学基礎工学部物性物理学教室助教授
1991 年 4 月　東京大学物性研究所軌道放射物性部門客員助教授（1992 年 3 月まで）
1994 年 8 月　アメリカ合衆国、カリフォルニア州バークレー市ローレンスバークレー
　　研究所に客員研究員として滞在（1995 年 5 月まで）
1997 年 4 月　奈良先端科学技術大学院大学物質創成科学研究科教授（評議員、学長補佐、
　　研究科長など兼務）
2004 年 7 月　立命館大学 COE 推進機構特別招聘教授
2019 年 3 月　奈良先端科学技術大学院大学教授を停年退職
2019 年 4 月　公益財団法人豊田理化学研究所フェロー
2019 年 4 月　日本原子力研究開発機構客員研究員（併任）

2.　　これまでの研究成果

１）昭和 51 年 4 月～昭和 53 年 3 月　東京大学理学部化学教室 朽津耕三研究室にて、修士論文研究として、気体分子（O_2,N_2,CCl_4,As_4）による低速電子散乱の実験的、理論的解析。

修士論文研究として数百 eV の電子線の気体分子からの微分散乱断面積（散乱角度分布）の測定と解析を行った。広い角度範囲にわたって散乱電子の強度を一点一点測定した。微分散乱断面積の中には分子内原子からの散乱波の干渉パターンが現れ、それを解析して分子構造を求めることができるが、分子内多重散乱が起きると構造解析に誤差が生じる。分子内多重散乱の大きさがどの程度か、どのようなパターンとして現れるか、などを明らかにするため、多重散乱の効果が顕著に現れることが予想される数百 eV の低エネルギーにおいて、いくつかの気体分子（O_2,N_2,CCl_4,As_4）について実験的及び理論的に解析した。理論計算は、独立原子モデルに分子内多重散乱、分極、電子交換などを考慮して行った。原子内及び原子間の干渉パターンが鈍り、絶対値が下がる効果を初めて明らかにした。

２）昭和 53 年 3 月～昭和 58 年 3 月　東京大学物性研究所表面物性部門 村田好正研究室にて、固体表面（Si の酸化,遷移金属シリサイド、S/Ni(001)）の放射光光電子分光・光電子回折による研究。

博士論文タイトル「Experimental and Theoretical Studies of Elastic Electron Scattering at Intermediate Energies and Photoemission Studies of Reactions on Semiconductor Surfaces Using Synchrotron Radiation」

当時は世界で初めての放射光専用リングが東大の田無キャンパスに建設され、表面研究への応用が可能になった時期であった。博士論文研究として、放射光を用いた光電子分光・光電子回折の研究を日本で初めて行った。Si は酸素励起種によって効率よく良質の酸化膜を作ること、Ni などの遷移金属シリサイドの電子状態は各成分のバンドの重ねあわせでよく理解できること、Ni(001)上の S からの光電子回折パターンから、S の吸着位置は最表面 Ni の 1.3Å上であることなどを明らかにした。光電子回折は、１）の電子の干渉効果を固体表面に応用したものである。これ以降、「光電子回折・光電子ホログラフィー」による表面の原子配列構造の研究を推進してきた。

ここでも広い角度範囲にわたって光電子の強度を一点一点測定していたが、光電子では強度が弱いためにこの測定は特に時間がかかり、角度分布が一度に測定できる二次元検出器の必要性を強く意識した。

３）昭和 58 年 3 月～平成 2 年 3 月　東京大学理学部物理学教室 井野正三研究室にて、二次元表示型球面鏡分析器の発明、RHEED を用いた表面構造の研究、超高真空走査電子顕微鏡の開発

その当時は、米国で回転楕円鏡型の二次元表示型分析器が Eastman によって発明されて使用されていたが、取り出し角度範囲は±43°程度が限界であり、また得られる像が歪んでいるという問題があった。そこで、新しい型の二次元表示型分析器の作成を目指して電子の軌道解析を繰り返して行った。その結果、球面を利用してメッシュと電極の間隔を 2 倍程度に大きくすると厳密に収束する解が得られ、かつ像の歪みはまったく無く、取り出し立体角はいくらでも大きく取れる（表面の場合は 180°）**二次元表示型球面鏡分析器**を発明することができた（図１）[１]。この分析器を用いると、試料から放出された電子の角度分布を、広い立体角に渡って二次元的に歪み無く一度に表示できる。一方向だけ取り込む従来の分析器に比べると一万倍程度効率が高い。この研究は、日本化学会若

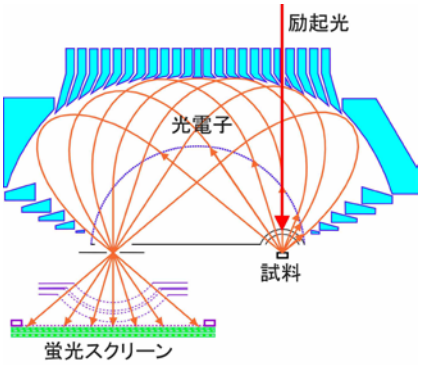

図１　二次元表示型球面鏡分析器

い世代の特別講演に選ばれた。

この時期のその他の研究としては、井野正三教授の指導で RHEED による表面構造解析、超高真空電子顕微鏡の作成（電子顕微鏡学会賞受賞）などが挙げられる。

４）平成２年３月～平成 ９年４月　大阪大学基礎工学部 物性物理学教室 菅滋正研究室にて、放射光二次元光電子分光、光電子ホログラフィーによる表面研究、円偏光光電子回折における前方散乱ピークの回転の発見

1990 年代になると放射光技術も進み、円偏光放射光が使えるようになったので、円偏光励起光電子回折の実験を企画した。円偏光励起ではスピンは変わらないが軌道角運動量が変わるので、光電子が軌道角運動量を持つことを予想した。Ｘ線を原子に照射すると、原子の中の電子は光電子となって飛び出す。その運動エネルギーが数百 eV 以上のとき，図２のように、光電子を放出した原子と，その隣の原子とを結ぶ方向に前方散乱ピークと呼ばれるピークが観測される。光電子が古典的な軌道角運動量を持てば、光電子回折パターンの中の前方散乱ピークが図のように回転するという予想を立てて実験を行ったところ、予想通りの回転を観測することができた。この結果は、これまで概念的にしか捉えられていなかった**軌道角運動量を初めて直接観測したことになり、非光学活性物質の円２色性を初めて観測した**ことにもなったので、応用物理学会賞を戴いた[2]。この「前方散乱ピークの回転」という現象の解釈の確立のため、米国の放射光施設 ALS でも実験と解析を行った。

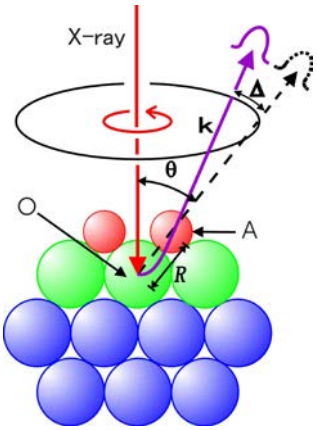

図２　前方散乱ピークの回転

また、固体のエネルギーバンドを、放射光を使って２次元的に測定すると、バンドを構成している電子の軌道や結合状態を明らかにできることを見出した[3]。**光電子構造因子**という概念を創出し、これを用いると、グラファイトではπバンドがp_z結合軌道から構成されていることが簡単にわかり、Bi 系超伝導体では$d_{x^2-y^2}$軌道がフェルミ面を作っていることを明らかにすることができた。

また、当時米国で開発された**光電子ホログラフィー**の研究を始めた。これは、円偏光ではない軟 X 線で励起した光電子角度分布をフーリエ変換することによって、着目原子の周りの原子配列を立体的に再現するものである。日本で初めての論文をいくつか報告した。

５）平成　９年４月～平成 31 年３月　奈良先端科学技術大学院大学物質創成科学研究科にて、偏光放射光二次元光電子分光による表面電子状態、立体原子写真法の発明

奈良先端科学技術大学院大学に移ってからは、文科省からの予算の他に、下記の外部資金をいただいて研究を進めてきたので、資金ごとにまとめる。

- **平成 10 年度～平成 13 年度　特別推進研究「二次元光電子分光と電子物性」（研究代表者）239,000,000 円**

研究目的は、図１の二次元光電子分光器のエネルギー分解能を高め、固体の電子エネルギーバンドを３次元的に測定し、物性のメカニズムを電子論的に解明しようというものであった。高エネルギー分解能の二次元表示型球面鏡分析器を作製し、それを用いて図３に示すグラファイトの３次元的なバンド構造の測定、原子軌道の帰属、ウムクラップ過程の解析にも成功した。多くのベストポスター賞を受け、事後評価もＡであった。

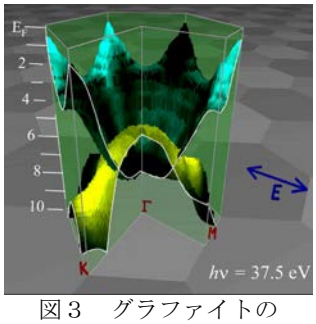

図３　グラファイトの３Ｄエネルギーバンド

◎立体原子写真法の発明

この研究を進めている中で、前述の「前方散乱ピークの回転」の回転角を視差角に見立てて、着目する原子の周りの原子配列を立体的に直視できるという「**立体原子写真法**」を発明することができた[4]。解析してみると、ほとんどゆがみのない立体写真が得られることがわかった。

立体写真を測定する装置は、上記の改良型「二次元表示型球面鏡分析器」である。図４(a),(b)は、この装置で測定した立体写真の例で，W(110) 面からのW４ｆ内殻光電子の放出角度分布パターンである。兵庫県の放射光施設 SPring-8 で使用できる円偏光Ｘ線を励起光として用いた。光電子の運動エネルギーは 800eV である。 (a),(b)は，それぞれ回転の向きが右および左の円偏光を用いて測定したものである。このパターンは，図４(d)のＯ原子から図(d)の上の方を見ていることになる。図４ (a),(b) においては，図４(d)の原子Ａ，B，C による前方散乱ピークが，図４(c)の A，B，C の位置に観測されている。しかしながら， (a),(b)におけるピーク位置は，結晶構造から予想される原子の方向（図４(c)の A，B，C の位置）より左右に少しずれていて、そのずれがＯ原子に人間がいて原子 A，B，C を両目で見たときの視差角と同じく、近くの原子ほど大きくなっている。従って、(a),(b)の図を左右の目でそれぞれ見ることにより，原子 A，B，C の立体配列を図４(d)のように直接認識することができる。このずれは，光電子が円偏光の角運動量をもらうことによって実質的に角運動量を持つため、原子の周りに回転しながら放射されることによって生じることを明らかにした。

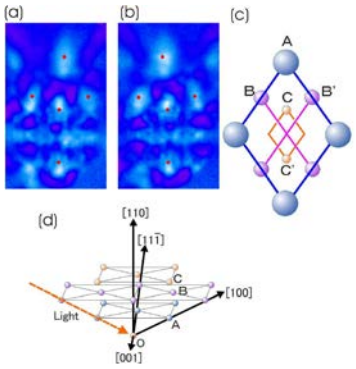

図４　W 結晶の立体写真

- **平成 14 年度～平成 19 年度　戦略的創造研究 CREST（科学技術振興機構）「ナノ構造解析のための立体原子顕微鏡の開発」（研究代表者）235,000,000 円**

この戦略的創造研究 CREST においては、上記で開発された立体原子写真法を種々の試料に応用して手法として確立すること、使いやすい測定装置を作製すること、および低倍率の機能を付加すること、の３つの目標があった。上記の立体写真を測定していた装置では、原子像が直視できる 10 億倍程度の高倍率の像は得られるものの、角度分布のみを測定しているため、不均一な試料のどこを見ているかを調べる低倍率の像は得られなかった。試料表面から飛び出した電子をレンズを使って焦点を結べば低倍率の拡大像が得られるが、これまでのレンズは±2°程度の範囲しか結像できず、立体原子写真法に必要な±50°のような広い角度範囲を収束することは不可能であった。そこで、非球面メッシュレンズを発明して、±50°に渡る角度範囲の放出電子を一点に収束できる広角対物レンズを実現し、特許を取得した。

● 平成 20 年度～平成 24 年度　**基盤研究（S）（文部科学省科学研究費補助金）「微小領域二次元光電子分光」（研究代表者）132,200,000 円**

この基盤研究（S）においては、上記で発明した±50°の広角対物レンズを用いて、低倍率の拡大像も得られて微小領域からだけの二次元光電子分光が行える高エネルギー分解能の分析器を完成することを目的とした。図 5 に組み上げた DELMA（Display-type Ellipsoidal Mesh Analyzer）を示す。図 5 の右下に示すように、試料表面の低倍率の拡大像、±50°の角度校正パターン、および光電子回折パターンを得ることに成功した[5]。高エネルギー分解能の測定の時には、図 5 のスクリーンを引き上げて、電子を後ろの市販の高エネルギー分解能の分析器に通す。一度に測定できる範囲は小さくなるが、試料や装置は動かさずにレンズの最後のデフレクタを走査するだけで±50°の角度に渡ってエネルギー分解能の高い測定が可能になった。

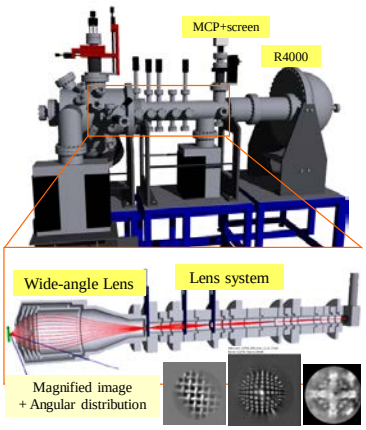

図 5　DELMA

● 平成 26 年度～平成 30 年度　**新学術領域研究（文部科学省科学研究費補助金）「３Ｄ活性サイト科学」（領域代表者）1,621,600,000 円**

前述の「光電子ホログラフィー」は、しばらくは原子像の再現精度が悪くて実用にならない状況が続いていたが、この頃までに松下らによる精度の良い解析手法が開発され、実用レベルに達していた。また、その他にも林による蛍光 X 線ホログラフィーの長足の進歩もあり、日本で原子分解能ホログラフィーの新学術領域を立ち上げる機運が高まり、平成 26 年度に採択されてスタートした。金属や半導体にドープされた元素は、機能発現に重要な役割を果たしているが、周期構造を取らないために通常の構造解析手段である X 線回折が使えず、局所構造がわからないままで開発が試行錯誤で行われていた。この新学術では、半導体、超伝導体、たんぱく質などのバイオ物質の中で活性を担っている元素の周りの原子配列を種々の原子分解能ホログラフィーを用いて解析することを目的としている。例として、Ca を層間に入れた超伝導体グラファイトに K をドープした試料を光電子ホログラフィーで観測した結果を図 6 に示す[6]。炭素の作るハニカム構造と、K がその 2 倍の周期で入っていることが良く分かる。他にも、Si 半導体中のヒ素ドーパントや、ヘモグロビンたんぱく質の中心で活性を担っている Fe の周りの原子配列など、多くの成果が上がっている。

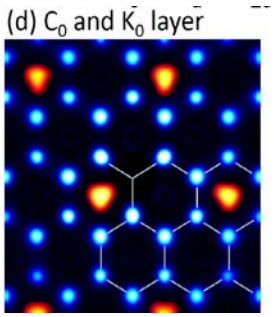

図 6　Ca と K をドープしたグラファイト超伝導体の光電子ホログラフィー

このように、これまで一貫して偏光の放射光を用いた二次元光電子分光を用いて、原子レベルの構造解析、および新しい解析法の開発を行ってきている。

[1] H. Daimon,
"New display-type analyzer for the energy and the angular distribution of charged particles", Rev. Sci. Instrum, 59, 545 (1988).

[2] H. Daimon, T. Nakatani, S. Imada, S. Suga, Y. Kagoshima, and T. Miyahara,
"Strong circular Dichroism in Photoelectron Diffraction from Non-chiral, Non-magnetic Material---Direct Observation of Rotational Motion of Electrons",
Jpn. J. Appl. Phys., 32 Part 2, L1480 (1993).

[3] H. Daimon, S. Imada, H. Nishimoto, and S. Suga,

"Structure factor in photoemission from valence band", J. Electron Spectrosc. Relat. Phenom. 76, 487 (1995).

[4] H. Daimon,
"Stereoscopic microscopy of atomic arrangement by circularly Polarized -Light Photoelectron Diffraction", Phys. Rev. Lett., 86, 2034 (2001).

[5] H. Matsuda, K. Goto, L. Toth, M. Morita, S. Kitagawa, F. Matsui, M. Hashimoto, C. Sakai, T. Matsushita, and H. Daimon,
"Development of display-type ellipsoidal mesh analyzer: Computational evaluation and experimental validation, J. Electr. Spectr. Rel. Phenom. 195, 382, (2014).

[6] F. Matsui, R. Eguchi, S. Nishiyama, M. Izumi, E. Uesugi, H. Goto, T. Matsushita, K. Sugita, H. Daimon, Y. Hamamoto, I. Hamada, Y. Morikawa, and Y. Kubozono,
"Photoelectron Holographic Atomic Arrangement Imaging of Cleaved Bimetal-intercalated Graphite Superconductor Surface", Scientific Reports 6, Article number: 36258 (2016).

［論文リスト］（査読のある原著論文）　大門　寛

(1) "Ni on Si: Interfacial Compound Formation and Electronic Structure", K. L. I. Kobayashi, S. Sugaki, A. Ishizaka, Y. Shiraki, H. Daimon and Y. Murata, *Phys. Rev. B*, **25** (2) 1377-1380 (1982).

(2) "Measurement of Differential Cross Sections of Low-Energy Electrons Elastically Scattered by Gas Molecules. II. Scattering of 200-500 eV Electrons by Molecular Oxygen", H. Daimon, S. Hayashi, T. Kondou and K. Kuchitsu, *J. Phys. Soc. Jpn.*., **51** (8) 2641-2649 (1982).

(3) "Ion Oxidation of Si(111)", H. Daimon and Y. Murata, *Jpn. J. Appl. Phys.*, **21** (11) L718-720 (1982).

(4) "Measurement of Differential Cross Sections of Low-Energy Electrons Elastically Scattered by Gas Molecules. III. Effects of Intramolecular Double Scattering as Observed inthe Scattering of 70-400 eV Electrons by Carbon Tetrachloride", H. Daimon, T. Kondou and K. Kuchitsu, *J. Phys. Soc. Jpn.*, **52** (1) 84-89 (1983).

(5) "Initial Stage of Sputtering in Silicon Oxide", T. Hattori, Y. Hisajima, H. Saito, T. Suzuki, H. Daimon, Y. Murata and M. Tsukada, *Appl. Phys. Lett.*, **42** (3) 244-246 (1983).

(6) "Evidence for Interference Between Direct and Inner-Shell-Deexcitation Photoemission in Semiconductors", K. L. I. Kobayashi, H. Daimon, N. Watanabe, M. Taniguchi, S. Suga, H. Nakashima and Y. Murata, *Physica*, **117B & 118B** 57-59 (1983).

(7) "Systematic Study of 3d Transition Metal-Silicon Interfaces by Photoemission", Y. Shiraki, K. L. I. Kobayashi, H. Daimon, A. Ishizaka, S. Sugaki and Y. Murata, *Physica*, **117B & 118B** 843-845 (1983).

(8) "Resonant Photoemission from Si", K. L. I. Kobayashi, H. Daimon and Y. Murata, *Phys. Rev. Lett.*, **50** (21) 1701-1704 (1983).

(9) "Measurement of Differential Cross Sections of Low-Energy Electrons Elastically Scattered by Gas Molecules: IV. Effect of Intramolecular Double Scattering as Observed in the Scattering of 100 and 500 eV Electrons by As_4", H. Daimon, T. Kondou and K. Kuchitsu , *J. Phys. B: At. Mol. Phys.*, **16** 3453-3464 (1983).

(10) "Valence Band Structure of Hydrogenated Amorphous Silicon-Carbon Alloys", Y. Katayama, T. Shimada, T. Uda, K.L.I. Kobayashi, C. G. Jiang, H. Daimon and Y. Murata, *Journal of Non-crystalline Solids*, **59 & 60** Part I 561-564 (1983).

(11) "Resonant Photoemission from Al-GaAs(110) Interfaces", K. L. I. Kobayashi, N. Watanabe, H. Nakashima, M. Kubota, H. Daimon and Y. Murata, *Phys. Rev. Lett.*, **52** (2) 160-163 (1984).

(12) "Comment on "Resonant Photoemission from Si", K. L. I. Kobayashi, H. Daimon and Y. Murata, *Phys. Rev. Lett.*, **52** (17) 1568-1569 (1984) .

(13) "New Models for the 7x7, 5x5, 2x8 Structures on Si(111) and Ge(111) Surfaces", S. Ino, H. Daimon and T. Hanada, *J. Phys. Soc. Jpn.*, **53** (6) 1911-1914 (1984) .

(14) "Resonant Photoemission in Open and Closed 3d Shell Systems: Ni_xSi(x=3, 2.5, 2, 1.5, 1, and 0.5)", H. Daimon, A. Ishizaka, K. L. I. Kobayashi and Y. Murata, *J. Phys. Soc. Jpn.*, **53** (6) 2130-2136 (1984) .

(15) "Performance of a New Plane-Grating Grazing-Incidence UHV Monochromator", S. Suga, M. Taniguchi, S.

Shin. H. Sakamoto, M. Yamamoto, M. Seki,Y. Murata and H. Daimon, *Nucl. Instr. and Meth. (Nuclear Instruments and Methods in Physics Research)* **222** 80-84 (1984).

(16) "Photoelectron Diffraction from Ni(001)c(2x2)-S(2p)", H. Daimon, H. Ito, S. Shin and Y. Murata, *J. Phys. Soc. Jpn.*, **53** (10) 3488-3497 (1984) .

(17) "Chemical Analysis of Surfaces by Total-Reflection-Angle X-ray Spectroscopy in RHEED Experiments (RHEED-TRAXS)", S. Hasegawa, S. Ino, Y. Yamamoto and H. Daimon, *Japn. J. Appl. Phys.*, **24** (6) L387-390 (1985).

(18) "Study of the Si(111)7x7 Surface Structure by Alkali-metal Adsorption", H. Daimon and S. Ino, *Surf. Sci.*, **164** (1) 320-326 (1985).

(19) "Electronic Structures of $CuFeS_2$ and $CuAl_{0.9}Fe_{0.1}S_2$ Studied by Photoelectron Spectroscopy: Role of Fe 3d Electron States", M. Fujisawa, M. Taniguchi, S. Shin, H. Daimon, H. Sakamoto, K. Sato and S. Suga, *Proc. 18th Int.* Conf. on the Physics of Semiconductors (World Scientific, ed. by O. Engstrom 1987, Singapore) 1137-1140.

(20) "A Study of Adsorption and Desorption Processes of Ag on Si(111) Surface by means of RHEED-TRAXS(Total ReflectionAngle X-ray Spectroscopy in RHEED experiments)", S. Hasegawa, H. Daimon and S. Ino, *Surf. Sci,*. **186** 138-162 (1987).

(21) "Si(111)7×7 and Si(111)$\sqrt{3}\times\sqrt{3}$-Al Surface Structure Analysis by Ion-Induced Auger Electron Spectroscopy", T. Aizawa, T. Tsuno, H. Daimon and S. Ino, *Phys. Rev. B*, **36** (17) 9107-9114 (1987).

(22) "New display-type analyzer for the energy and the angular distribution of charged particles", H. Daimon, *Rev. Sci. Instrum*, **59** (4) 545-549 (1988). [Erratum: Rev. Sci. Instrum. **61** (1) 205 (1990).]

(23) "新しい２次元表示型球面鏡分析器の解析", 大門寛、井野正三, 真空, **31** (12) 954-959 (1988).

(24) "Soft x-ray beamline (10-1000 eV) with a plane grating monochromator for surface studies", H. Namba, H. Daimon, Y. Idei, N. Kosugi, H. Kuroda, M. Taniguchi, S. Suga, Y. Murata, K. Ueyama and T. Miyahara, *Rev. Sci. Instrum.*, **60** (7) 1909-1912 (1989).

(25) "Study of the Si(111) $\sqrt{3}\times\sqrt{3}$-Al Surface Structure by Kinetic Energy Dependence of Polar Angle Photoelectron Diffraction", H. Daimon, S. Nagano, T. Hanada, S. Ino, S. Suga and Y. Murata, *Surf. Sci.*, **221** (2/3) 244-252 (1989).

(26) "One Dimensional Circular Diffraction Patterns", H. Daimon and S. Ino, *Surf. Sci.*, **222** (1) 274-282 (1989).

(27) "Improvement of the spherical mirror analyzer", H. Daimon and S. Ino, *Rev. Sci. Instrum.*, **61** (1) 57-60 (1990).

(28) "Vacuum Ultraviolet Reflectance and Photoemission Study of Metal-Insulator Phase Transition in VO_2, V_6O_{13} and V_2O_3", S. Shin, S. Suga, M. Taniguchi. M. Fujisawa, H. Kanzaki, A. Fujimori, H. Daimon, Y. Ueda, K. Kosuge and S. Kachi, *Phys. Rev. B*, **41** 4993-5009 (1990).

(29) "ESDIAD with a new display-type spherical mirror analyzer", H. Daimon and S. Ino, Proc. the IVC-11/ICSS-7 (Cologne, 1989); *Vacuum*, **41** (1-3) 215-216 (1990).

(30) "A Study of Si(111)5×2-Au Structures by Li Adsorption and Their Co-adsorbed Superstructures", H. Daimon, C. I. Chung, S. Ino and Y. Watanabe, *Surf. Sci.*, **235** (2/3) 142-155 (1990).

(31) "Change of Surface Electronic States Induced by Li and K Adsorption on the Si(111)7×7 Structure", Y. Tezuka, H. Daimon and S. Ino, *Jpn. J. Appl. Phys.*, **29** (9) 1773-1777 (1990).

(32) "Two Dimensional Photoelectron Diffraction Pattern by Display-type Spherical Mirror Analyzer", H. Daimon, Y. Tezuka, A. Otaka, N. Kanada, S. K. Lee, S. Ino, H. Namba and H. Kuroda, Proc. XXVI Yamada Conference on Surface as a New Material (Osaka 1990), *Surf. Sci.*, **242** 288-293 (1991).

(33) "Photoelectron Diffraction Patterns by Display-Type Spherical Mirror Analyzer", H. Daimon, Y. Tezuka, N. Kanada, A. Otaka, S. K. Lee, S. Ino, H. Namba and H. Kuroda, Proc. 3rd Int. Conf. on the Structure of Surfaces, (Milwaukee 1990), Springer Series in Surface Science, **24** "The Structure of Surfaces III" ed. S.Y.Tong et al. 96-101 (Springer, Berlin 1991).

(34) "Direct Observation of Surface Structures by a High Resolution UHV-SEM", S. Ino, A. Endo and H. Daimon, Proc. 3rd Int.Conf. on the Structure of Surfaces, (Milwaukee 1990), Springer Series in *Surf. Sci.*, **24** "The Structure of Surfaces III" ed. S.Y.Tong et al. 168-173 (Springer, Berlin 1991).

(35) "Catalytic Effect of Metals (Sn, Ag, and Pb) on Homoepitaxial Growth of Ge and Si", K. Fukutani, H. Daimon and S. Ino, Proc. 3rd Int.Conf. on the Structure of Surfaces, (Milwaukee 1990), Springer Series in *Surf. Sci.*, **24** "The Structure of Surfaces III" ed. S.Y.Tong et al. 615-622 (Springer, Berlin 1991).

(36) "Electronic Structures of Mn_2Sb and MnAlGe: Photoemission and Inverse Photoemission Spectroscopy", Kimura, S. Suga, H. Matsubara, T. Matsushita, Y. Saitoh, H. Daimon, T. Kaneko and T. Kanomata, Solid State Communications, **81** (8) 707-710 (1992).

(37) "Glancing Angle Dependence of the X-ray Emission Measured at Total Reflection Angle X-ray Spectroscopy (TRAXS) Condition During RHEED Observation", T. Yamanaka, T. Hanada, S. Ino and H. Daimon, *Jpn. J. Appl. Phys. Lett*,. **31** L1503-L1505 (1992).

(38) "Reflection High-Energy Electron Diffraction Study of the Growth of Ge on the Ge(111) Surface", K. Fukutani, H. Daimon and S. Ino, *Jpn. J. Appl. Phys.*, **31** Part I, (19) 3429-3435 (1992).

(39) "Resonant Photoemission Spectroscopy of Mn_2As, Cr_2As and Fe_2As", T. Matsushita, A. Kimura, H. Daimon, S. Suga, T. Kanomata and T. Kaneko, *Jpn. J. Appl. Phys.*, **31** L1767-1770 (1992).

(40) "Simultaneous angle-resolved measurement of the band structure of single-crystal graphite by an improved two-dimensional display analyzer", H. Nishimoto, H. Daimon, S. Suga, Y. Tezuka, S. Ino, I. kato, F. Zenitani, and H. Soezima, *Rev. Sci. Instrum.*, **64** 2857-2862 (1993).

(41) "Photoemission and Absorption Spectroscopy of Mn_2Sb, MnAlGe, Mn_2As, Cr_2As and Fe_2As", Kimura, S. Suga, T. Matsushita, H. Daimon, T. Kaneko and T. Kanomata, *J. Phys. Soc. Jpn.*, **62** 1624-1633 (1993).

(42) "Strong circular Dichroism in Photoelectron Diffraction from Non-chiral, Non-magnetic Material---Direct Observation of Rotational Motion of Electrons", H. Daimon, T. Nakatani, S. Imada, S. Suga, Y. Kagoshima and

T. Miyahara, *Jpn. J. Appl. Phys.*, **32** Part 2 (10A) L1480-L1483 (1993).

(43) "Development of an Ultrahigh Vacuum High Resolution Scanning Transmission Electron Microscope", Y. Harada, T. Tomita, Y. Kokubo, H. Daimon and Shozo Ino, *J. Electron Microsc.*, **42** 294-304 (1993).

(44) "Electronic Structure of Ni Intercalated TiS_2 Probed by Angle Resolved and 2p Core Resonance Photoemission as well as by 2p Core Absorption Spectroscopy", Kimura, S. Suga, T. Matsushita, S. Imada, N. Shino, Y. Saitoh, H. Shigeoka, H. Daimon, T. Kinoshita, A. Kakizaki, S.-J. Oh, H. Negishi and M. Inoue, Proc. 9th Int. Conf. Ternary and Multinary Compounds, (Yokohama, Aug. 1993), *Jpn. J. Appl. Phys.*, **32** Suppl. 32-3 255-257 (1993).

(45) "Electron Stimulated Desorption (ESD) of O_2/Si(111) Surface", K. Sakamoto, K. Nakatsuji, H. Daimon, T. Yonezawa, and S. Suga, *Surf. Sci.*, **306** 93-98 (1994).

(46) "Photon Stimulated Desorption Mechanism of Cl^+ ions from Cl/Si(111) Surface", T. Yonezawa, H. Daimon, K. Nakatsuji, K. Sakamoto, and S. Suga, Proc. 第15回ドライプロセスシンポジウム (東京, Nov. 1993), *Jpn.J.Appl.Phys.*, **33** 2248-2251 (1994).

(47) "Photoemission Study of the Si(111)3×1-K Surface", K. Sakamoto, T. Okuda, H. Nishimoto, H. Daimon, S. Suga, T. Kinoshita, and A. Kakizaki, *Phys. Rev. B*, **50** 1725-1732 (1994).

(48) "Adsorption and desorption process of Cl on Si(111)7×7", T. Yonezawa, H. Daimon, K. Nakatsuji, K. Sakamoto, and S. Suga, Proc. 1st Int. Conf. Photo-Excited Processes and Applications, (Sendai, Oct. 1993), *Appl. Surf. Sci.*, **79/80** 95-99 (1994).

(49) "Study of the Si(111)7×7 surface by RHEED rocking curve analysis", T. Hanada, S. Ino and H. Daimon, *Surf. Sci.*, **313** 143-154 (1994).

(50) "Surface and Bulk Core Level Shifts of the Si(111)3×1-Na and Si(111)δ7×7-Na Surfaces", T. Okuda, H. Shigeoka, H. Daimon, S. Suga, T. Kinoshita, and Kakizaki, *Surf. Sci.*, **321** 105-110 (1994).

(51) "Circularly polarized light-induced dichroism in photoelectron diffraction observed with display-type spherical mirror analyzer", H. Daimon, T. Nakatani, S. Imada, S. Suga, Y. Kagoshima and T. Miyahara, *Rev. Sci. Instrum.* **66** (2) 1510-1512 (1995 Feb).

(52) "Rocking-curve analysis of reflection high-energy electron diffraction from the Si(111)-($\sqrt{3}\times\sqrt{3}$)R30° -Al, -Ga, and –in surfaces", T. Hanada, H. Daimon, and S. Ino, *Phys. Rev. B* **51** 13320-13325 (1995).

(53) "Spin-resolved 3p and 3s core-level photoemission spectra of ferromagnetic nickel", Y. Saitoh, T. Matsushita, S. Imada, H. Daimon, S. Suga, J. Fujii, K. Shimada, A. Kakizaki, K. Ono, M. Fujisawa, T. Kinoshita, and T. Ishii, *Phys. Rev. B* **52** R11549-R11552 (1995).

(54) "Circular dichroism from non-chiral and non-magnetic materials observed with display-type spherical mirror analyzer", H. Daimon, T. Nakatani, S. Imada, and S. Suga, *J. Electron Spectrosc. Relat. Phenom.* **76** 55-62 (1995).

(55) "Structure factor in photoemission from valence band", H. Daimon, S. Imada, H. Nishimoto, and S. Suga, *J. Electron Spectrosc. Relat. Phenom.* **76** 487-492 (1995).

(56) "Two-dimensional angular distribution of photoelectrons of single crystal graphite", H. Nishimoto, T. Nakatani, T. Matsushita, S. Imada, H. Daimon and S. Suga, *J. Phys.: Condens. Matter* **8** 2715-2732 (1996).

(57) "Unusual two-dimensional angular distribution of photoelectrons of Kish graphite and 1T-TaS_2", H. Nishimoto, T. Okuda, T. Nakatani, H. Daimon, T. Matsushita, S. Imada, S. Suga, H. Namba, T. Ohta, Y. Kagoshima, T. Miyahara, *Solid State Commun.* **98** (7) 671-675 (1996).

(58) "Electron- and Photon-Stimulated Desorption of the NO/Si(111) surface", K. Sakamoto, K. Nakatsuji, H. Daimon, T. Yonezawa, S. Suga, H. Namba and T. Ohta, *Surf. Sci.* **359** (147-1541996) .

(59) "Spin-resolved Core-level Photoemission Spectra of Ferromagnetic Nickel", Y. Saito, S. Suga, A. Kakizaki, T. Matsushita, S. Imada, H. Daimon, K. Ono, M. Fujisawa, T. Kinoshita, T.Ishii, J.Fujii, and K.Shimada, *J. Electron Spectrosc. Relat. Phenom.* **78** 329-332 (1996).

(60) "Unusual photoelectron angular distribution of Kish graphite", H. Nishimoto, H. Daimon, S. Suga, S. Imada, T. Matsushita, T. Nakatani, H. Namba, T. Ohta, Y. Kagoshima, and T. Miyahara, *J. Electron Spectrosc. Relat. Phenom.* **78** 465-468 (1996).

(61) "Angle-resolved photoemission study of $MxTiS_2$ (M=Mn, Fe, Co, Ni; x=1/3, 1/4)", T. Matsushita, S. Suga, Y. Tanaka, H. Shigeoka, T. Nakatani, T. Okuda, T. Terauchi, T. Shishidou, A. Kimura, H. Daimon, S.-J Oh, A. Kakizaki, T. Kinoshita, H. Negishi, and M. Inoue, *J. Electron Spectrosc. Relat. Phenom.* **78** 477-480 (1996) .

(62) "Two-dimensional angular distribution of photoemission spectra from the valence band of 1T-TaS_2", T. Matsushita, H. Nishimoto, T. Okuda, T. Nakatani, H. Daimon, S. Suga,H. Namba, T. Ohta, Y. Kagoshima, and T. Miyahara, *J. Electron Spectrosc. Relat. Phenom.* **78** 489-492 (1996).

(63) "Photon-Stimulated Desorption study of the NO/Si(111) surface", K. Sakamoto, K. Nakatsuji, H. Daimon, T. Yonezawa, S. Suga, H. Namba and T. Ohta, *J. Electron Spectrosc. Relat. Phenom.* **80** 125-128 (1996).

(64) "Surface core level shifts of the Au adsorbed Si(111) reconstructed surfaces", T. Okuda, H. Daimon, H. Shigeoka, S. Suga, T. Kinoshita, and Kakizaki, J. Electron Spectrosc. Relat. Phenom. **80** 229-232 (1996).

(65) "Adsorption and desorption processes of Cl on Si(100) Surface", K. Nakatsuji, K. Matsuda, T. Yonezawa, H. Daimon, and S. Suga, *Surf. Sci.* **363** 321-325 (1996).

(66) "Energy barrier for ion desorption due to discrete surface dipoles", T. Yonezawa, H. Daimon, K. Nakatsuji, K. Sakamoto, and S. Suga, *Surf. Sci.* **365** 489-494 (1996).

(67) "Photoelectron holography of the Si(001) surface", T. Nakatani, H. Nishimoto, H. Daimon, S. Suga, H. Namba, T. Ohta, Y. Kagoshima, T. Miyahara, *J. Synchrotron Rad.* **3** 239-244 (1996).

(68) "Polarization measurement and vertical aperture optimization for obtaining circularly polarized bend-magnet radiation", J.B. Kortright, M.E. Rice, Z. Hussain, H.A. Padmore, A.T. Young. A. Adamson, W.R.A. Huff, E.J. Moler, S.A. Kellar, R.X. Ynzunza, F.J. Palomares, H. Daimon, E.D. Tober, and C.S. Fadley, *Rev. Sci. Instrum.* **67** (9) (1996).

(69) "Dichroism in Core Photoelectron Diffraction Spectra of Si(001) in Dependence on the Photon Polarization", P. Rennert, A.Chasse, T.Nakatani, K.Nakatsuji, H.Daimon, and S.Suga, *J. Phys. Soc. Jpn.* **66** (2) 396-400

(1997).

(70) "Angle resolved photoelectron spectroscopy of the Si(111)3×1-Na surface", T. Okuda, K. Sakamoto, H. Nishimoto, H. Daimon, S. Suga, T. Kinoshita, and A. Kakizaki, *Phys. Rev. B*, **55** 6762-6765 (1997).

(71) "High resolution photoemission study of $CeRu_2Si_2$", M. Tsunekawa, S. Suga, A. Kimura, T. Matsushita, T. Muro, S. Ueda, H. Daimon, S. Imada, T. Nakatani, Y. Saitoh, T. Iwasaki, A. Sekiyama, A. Fujimori, H. Ishii, T. Miyahara, T. Hanyu, H. Namatame, M. Taniguchi, E. Shigemasa, O. Sakai, R. Settai, H. Azuma, Y. Onuki, *Solid State Commun.,* **103** (12) 659-662 (1997).

(72) "Linear and circular dichroism in photoemission angular distribution from the valence band of 1T-TaS_2", T. Matsushita, S. Imada, H. Daimon, T. Okuda, K. Yamaguchi, H. Miyagi, and S. Suga, *Phys. Rev. B*, **56** (12) 7687-7693 (1997).

(73) "Surface electronic structure of ordered alkali- and noble metal-overlayers on Si(111)", T. Okuda, H. Daimon, S. Suga, Y. Tezuka, and S. Ino, *Appl. Surf. Sci.,* **121/122** 89-97 (1997).

(74) "Photoelectron diffraction of the Si(111)-($\sqrt{3}\times\sqrt{3}$)R30° -Ga surface: local atomic structure and vibrational correlation", Hanada, H. Daimon, S.Nagano, S. Ino, S. Suga, and Y. Murata, *Phys. Rev. B*, **55** 16420-16425 (1997).

(75) "Photoelectron Diffraction: Space, Time, and Spin Dependence of Surface Structures", C.S. Fadley, M.A. Van Hove, Z. Hussain, A.P. Kaduwela, R. Couch, Y.J. Kim, P. Len, F.J. Palomares, S. Ryce, S. Ruebush, E.D. Tober, Z. Wang, R.X. Ynzunza, H. Daimon, H. Galloway, M.B. Salmeron, and W. Schattke, *Surface Review and Letters*, **4** 421-440 (1997).

(76) "Diffraction and Holography with Photoelectrons and fluorescent X-ray", C.S. Fadley, Y. Chen, R.E. Couch, H. Daimon, R. Denecke, J.D. Denlinger, H. Galloway, Z. Hussain, A.P. Kaduwela, Y.J. Kim, P.M. Len, J. Liesegang, J. Menchero, J. Morais, J. Palomares, S.D. Ruebush, E. Rotenberg, M.B. Salmeron, R. Scalettar, W. Schattke, R. Singh, S. Thevuthasan, E.D. Tober, M.A. Van Hove, Z. Wang and R.X. Yuzunza, *Surf. Sci.*, **54** (3/4) 341-386 (1997).

(77) "Surface, Interface, and Nanostructure Characterzation with Photoelectron Diffraction and Photoelectron and X-ray Holography", C.S. Fadley, Y. Chen, R.E. Couch, H. Daimon, R. Denecke, H. Galloway, Z. Hussain, A.P. Kaduwela, Y.J. Kim, P.M. Len, J. Liesegang, J. Menchero, J. Morais, J. Palomares, S.D. Ruebush, S. Ryce, M.B. Salmeron, W. Schattke, S. Thevuthasan, E.D. Tober, M.A. Van Hove, Z. Wang, R.X. Ynzunza, and J. J. Zaninovich , *Journal of Surface Analysis*, **3** 334-364 (1997).

(78) "Direct Structure Analysis of W(110)(1x1)-O by Full-Solid-Angle X-ray Photoelectron Diffraction with Chemical-State-Resolution", H. Daimon, R. Ynzunza, F.J. Palomares, H. Takagi, and C.S. Fadley, *Surf. Sci.,* **408,** 260-267 (1998).

(79) "Twin helical undulator beamline for soft X-ray spectroscopy at SPring-8", Y. Saitoh, T. Nakatani, T. Matsushita, T. Miyahara, M. Fujisawa, K. Soda, T. Muro,S.Ueda, H. Harada, A. Sekiyama, S.Imada, H. Daimon and S.Suga, *J.Synchrotron Rad.* **5**, 542-544 (1998).

(80) "Circular Dichroism in Core-Level Emission from O/W(110): Experiment and theory", H. Daimon, R.X. Ynzunza, F.J. Palomares, E.D. Tober, Z.X. Wang, A.P. Kaduwela, M.A. Van Hove, and C.S. Fadley, *Phys. Rev. B*, **58,** 9662-9665 (1998).

(81) "Observation of circular dichroism in angular distribution of the valence band photoelectron from Si(001) in UPS region", K. Nakatsuji, H. Daimon, T. Furuhata, H. Takagi, M. Fujikawa, S. Suga, T. Miyahara, A. Yagishita, C.-H. Solterbeck, and W. Schattke, Proceedings of the 7-th International Conference on Electron Spectroscopy (September 8-12, 1997, Chiba, Japan) and *J. Electron Spectrosc. Relat. Phenom.*, **88-91,** 213-218 (1998).

(82) "Two-dimensional angle resolved resonance photoelectron spectroscopyof 1T-TaS_2", T. Okuda, H. Daimon, K. Nakatsuji, M. Kotsugi, S. Suga, Y. Tezuka, S. Shin, T. Hasegawa, and K. Kitazawa, Proceedings of the 7-th International Conference on Electron Spectroscopy, (September 8-12, 1997, Chiba, Japan) and *J. Electron Spectrosc. Relat. Phenom.*, **88-91,** 287-292 (1998).

(83) "Effect of Coster-Kronig decay on Ce 3d-4f resonant photoemission spectra of $CeOs_2$", H. Ishii, T. Kimura, T. Miyahara, T. Hanyu, T. Iwasaki, S. Ueda, M. Tsunekawa, T. Nakatani, T. Matsushita, S. Imada, H. Daimon, S. Suga, A. Sekiyama, A. Fujimori, H. Namatame, M. Taniguchi, A. Kimur, H. Sugawara, Y. Aoki, and H. Sato, Proceedings of the 7-th International Conference on Electron Spectroscopy (September 8-12, 1997, Chiba, Japan)and *J. Electron Spectrosc. Relat. Phenom.* **88-91**, 419-424 (1998).

(84) "Fermi Surface of Sr_2RuO_4 sutudied by two-dimensional angle resolved photoelectron spectroscopy", T. Okuda, H. Daimon, M. Kotsugi, K. Nakatsuji, M. Fujikawa, S. Suga, Y. Tezuka, S. Shin, M. Kasai, and Y. Tokura, Proceedings of the 7-th International Conference on Electron Spectroscopy (September 8-12, 1997, Chiba, Japan) and *J. Electron Spectrosc. Relat. Phenom.***88-91**, 473-477 (1998).

(85) "Symmetry Analysis of the Fermi Surface of $Bi_2Sr_2CaCu_2O_8$ by Display Analyzer"M. Kotsugi, H. Daimon, K. Nakatsuji, T. Okuda, T. Furuhata, M. Fujikawa, H.Takagi, Y. Tezuka, S. Shin, K. Kitahama, T. Kawai, and S. Suga, Proceedings of the 7-th International Conference on Electron Spectroscopy (September 8-12, 1997, Chiba, Japan) and *J. Electron Spectrosc. Relat. Phenom.*, **88-91,** 489-493 (1998).

(86) "Temperature-Dependent Change of Correlated Electronic States in Yb_4As_3 and $Yb_4(As_{1-x}Sb_x)_3$ Probed by High Resolution Photoemission Spectroscopy",S. Suga, A. Ochiai, T. Suzuki, H. Harada, A. Sekiyama, T. Matsushita, T. Iwasaki, A. Kimura, M. Tsunekawa, T. Muro, S.Ueda, H. Daimon, S. Imada, H. Namatame, M. Taniguchi, H. Ishii, T. Miyahara, T. Hanyu, and A. Fujimori, *J. Phys. Soc. Jpn.* **67** (10), 3552-3560 (1998).

(87) "Correlated electronic states of Yb_4As_3 studied with photoemission", S. Suga, H. Harada, T. Iwasaki, T. Muro, T. Matsushita, A. Sekiyama, S. Imada, H. Daimon,H. Ishii, A. Fujimori, A. Ochiai, T. Suzuki, *J. Electron Spectrosc. Relat. Phenom.*, **88-91**, 315-319 (1998).

(88) "Two-dimensional band mapping of 2H-$TaSe_2$ using a display-type photoelectron spectrometer", T. Okuda, K. Nakatsuji, S. Suga, Y. Tezuka, S. Shin and H. Daimon, VUV12 Proceedings (1998), and *J. Electron Spectrosc. Relat. Phenom.*, **101-103**, 355-360 (1999).

(89) "Characterization of Electronic States Using a Polarized Light and a Display Analyzer", H. Daimon, M. Kotsugi, T. Okuda, K. Hattori, Proceedings of the 2nd International Conference on Synchrotron Radiation in Materials Science (Oct. 31 - Nov. 3,1998, Kobe, Japan), *Jap. J. Appl. Phys.* **38**, 630-633 (1999).

(90) "Deduction of atomic orbitals in a valence band by two-dimensional angular distribution of photoelectrons", H. Daimon, M. Kotsugi, K. Nakatsuji, T. Okuda, K. Hattori, *Surf. Sci.*, **438**, 214-222 (1999).

(91) "Symmetry Analysis of the Fermi Surface States of Sr_2RuO_4 by Display-Type Photoelectron Spectroscopy", T. Okuda, M. Kotsugi, K. Nakatsuji, M. Fujikawa, S. Suga, Y. Tezuka, S. Shin, M. Kasai, Y. Tokura and H.

Daimon, *J. Phys. Soc. Jpn.*, **68** (4), 1398-1403 (1999).

(92) "Full solid angle photoelectron diffraction from bulk and surface atoms of clean W(110)", R. X. Ynzunza, E. D. Tober, , F. J. Palomares, Z. Wang,, H. Daimon, A. P. Kaduwela, Y. Chen, Z. Hussain, M. A. Van Hove, C. S. Fadley, *Surf. Sci.*,**441**, 301-310 (1999).

(93) "Structure determination for saturated (1x1) oxygen on W(110) from full solid angle photoelectron diffraction with chemical-state resolution", R. X. Ynzunza, F. J.Palomares, E. D. Tober, Z. Wang, J. Morais, R. Denecke, H. Daimon, Y. Chen, Z. Hussain, M. A. Van Hove, C. S. Fadley, *Surf. Sci.*, **442**,27-35 (1999).

(94) "Metastable Domain Structure of Ferromagnetic Microstructure Observed by Soft X-Ray Magnetic Circular Dichroism Microscopy", S. Imada, S. Ueda, R. Uung, Y. Saitoh, M. Kotsugi, W. Kuch, J. Gilles, S. Kang, F. Offi, J. Kirchner, H. Daimon, T. Kimura, J. Yanagisawa, K. Gamo and S. Suga, *Jpn.J. Appl. Phys.*, **39**, L585-L587 (2000).

(95) "Two-dimensional circularly-polarized-light photoelectron diffraction for the analysis of magnetic and electronic properties on surface", K. Enomoto, Y.Miyatake, K. Fukumoto, A. Kobayashi, K. Hattori, H. Daimon, M. Kotsugi,S. Suga, T. Nakatani, T. Matsushita, *Surf. Rev. Lett.*, **7**, (5&6) 643-647 (Octorber, 2000).

(96) "Photoelectron holography analysis of W(110)(1x1)-O surface'', H. Takagi, H. Daimon, F. J. Palomares, C. S. Fadley, *Surf. Sci.*, **470** 189-196 (2001) .

(97) "Direct surface-structure analysis by the peak rotation in circularly polarized-light photoelectron diffracton", H. Daimon, S. Imada, S. Suga, *Surf. Sci.*, **471** (1-3), 143-150 (2001).

(98) "Stereoscopic microscopy of atomic arrangement by circularly Polarized -Light Photoelectron Diffraction", H. Daimon, *Phys. Rev. Lett.*, **86** 2034-2037 (2001).

(99) "Construction of two-dimensional photoelectron spectrometer at SPring-8", M. Kotsugi, Y. Miyatake, K. Enomoto, K. Fukumoto, A. Kobayashi, T. Nakatani, Y. Saitoh, T. Matsushita, S. Imada, T. Furuhata, S. Suga, K. Soda, M. Jinno, T. Hirano, K. Hattori, H. Daimon, *Nucl. Instrum. and Meth. A*, **467-468** 1493-1496 (2001).

(100) "Effective magnetic quantum number and effective emitter-scatterer distance obtained from W 4*f* photoelectron diffraction induced by circularly polarized light on W(110)", K. Hattori, A. Kobayashi, K. Fukumoto, Y. Miyatake, H. Daimon, M. Kotsugi, S. Suga, T. Nakatani, T. Matsushita, *Surf. Sci.*, **493**, 15-22 (2001).

(101) "Stereo-microscopy of atomic arrangements on thin films using circular dichroism in x-ray photoelectron angular distribution", S. Okamoto, A. Nakamoto, S. Hayashi, K. Fukumoto, T. Nakatani, T. Matsushita, K. Hattori, H. Daimon, *Trans. Magn. Soc. Japan*, **2**, (4) 228-233 (2002).

(102) "Development of Electron Source for Auger Electron Spectroscopy in Scanning Probe Microscope Systems", Y. Miyatake, T. Nagamura, K. Hattori, Y. Kanemitsu, H. Daimon, *Jpn. J. Appl. Phys.*, **41**, 4943-4947 (2002).

(103) "Photoelectron diffraction stereograph by display-type spherical mirror analyzer", H. Daimon, *J. Elec. Spect. Rel. Phem.*, **124**, 139-149 (2002).

(104) "Micromagnetic properties of the Cu/Ni crossed-wedge film on Cu(001)", K. Fukumoto, H. Daimon, L. Chelaru, F. Offi, W. Kuch and J. Kirschner, *Surf. Sci.*, **514**, 151-155 (2002).

(105) "Three-dimensional band mapping of graphite", F. Matsui, Y. Hori, H. Totsuka, H. Miyata, K. Ogawa, T. Furukubo, N. Suganuma, H. Namba and H. Daimon, *Appl. Phys. Lett.*, **81** (14), 2556-2558 (September 2002).

(106) "GaP($\bar{1}\bar{1}\bar{1}$) reconstructed surface studied with STM and LEED", K. Hattori, K. Ishihara, Y. Miyatake, F. Matsui, S. Takeda, H. Daimon, F. Komori, *Surf. Sci.*, **525**, 57-65 (2003).

(107) "Development of High-Energy-Resolution Display-Type Photoelectron Spectrometer in the UPS Region", T. Nohno, F. Matsui, Y. Hamada, H. Matsu-moto, S. Terada, K. Hattori, H. Daimon, *Jpn. J. Appl. Phys.*, **42** 4752-4755 (2003).

(108) "Development of Scanning Probe Microscope for Auger Analysis", Y. Miyatake, T. Nagamura, K. Hattori, Y. Kanemitsu, H. Daimon, *Jpn. J. Appl. Phys.*, **42,** 4848-4851 (2003)

(109) "Application of atomic stereo microscope to surface science", T. Nakatani, T.Matsushita, S. Okamoto, K. Fu kumoto, A. Kobayashi, A. Nakamoto,T. Nohno, K. Hattori, K. Enomoto, Y.Miyatake, M. Kotsugi, Y. Saitoh, S. Suga, H. Daimon, *Progress in Surf. Sci.*71, 217-239 (2003)

(110) "Stereoscopic photographs of atomic arrangements in MoS_2 single-crystal", F. Z. Guo, F. Matsui, M. Fujikado, T. Matsushita, H. Daimon, Applied Surf. Sci, 237, (1-4) 616-620 (2004).

(111) "Atomic structure of Fe thin-films on Cu(001) studied with Stereoscopic photography" A.N.Hattori, M.Fujikado, T.Uchida, S.Okamoto, K.Fukumoto, F.Z.Guo, F.Matsui, K.Nakatani, T.Matsushita, K.Hattori, H.Daimon, Applied Surf. Sci, 237, (1-4) 311-315 (2004)

(112) "Visaualization of graphite atomic arrangement by stereo atomscope" F.Matsui, H.Daimon, F.Z.Guo, T.Matsushita,, Appl. Phys. Lett. 85,(17) 3737-3739 (2004)

(113) "Si(111)2×2-Fe surface reacted with nitric oxide" K. Hattori, T. Nishimura, K. Kataoka, Y. Shimamoto, H. Daimon, Thin Solid Films, 464-465, 5-9 (2004).

(114) "Erratum to "Stereoscopic photographs of atomic arrangements in MoS2 single-crystal"", F. Guo, F. Matsui, M. Fujikado, T. Matsushita, H. Daimon, Applied Surface Science Vol.239 Issue1, 616-620, (2004).

(115) "Magnetism-induced symmetry breaking in photoelectron diffraction patterns", A.Chasse, W.Kuch, M.Kotsugi, X.Gao, F.Offi, S.Imada, S.suga, H.Daimon, J.Kirschner, Phys. Rev. B 71, (1) 01444 (2005).

(116) "Visualization of in-plane dispersion of hole subbands by photoelectron spectroscopy", S. Nishino Takeda, N. Higashi, H. Daimon, Phys. Rev. Lett. 94, (3) 037401-1-4 (2005)

(117) "Anisotropy of surface vibration measured by temparature dependence of the spot intensity in reflection high-energy electron diffraction", M. Hashimoto, S. Takeda, H. Daimon, Phys. Rev. B 71, (11) 113314-1-4 (2005).

(118) "Scanning Tunneling Microscopy Observation of Germapericycline on a Graphite Surface", J. Nayeem, S. Nishino Takeda, F. Matsui, K. Hattori, H. Daimon, Journal of the Vacum Society of Japan Vol.48, No.5, 304-308 (2005).

(119) "Atomic stereo-photographs of Cu single crystal taken by stereo atomscope", F.Z. Guo, F.Matsui, T.Matsushita, H.Daimon, J. Electron Spectrosc. Rel. Phenom., 144-147, 1067-1070 (2005).

(120) “Approach for simultaneous measurement of two-dimensional angular distribution of charged particles: Spherical aberration correction using an ellipsoidal mesh”, H. Matsuda, H. Daimon, M. Kato, M. Kudo, Phys. Rev. E 71, (6) 066503-1-8 (2005)

(121) “Atomic-orbital analysis of the Cu Fermi surface by two-dimensional photoelectron spectroscopy”, F. Matsui, H. Miyata, O. Rader, Y. Hamada, Y. Nakamura, K. Nakanishi, K. Ogawa, H. Namba, H. Daimon, Phys. Rev. B 72, (19) 195417-1-5 (2005).

(122) “Structural analysis of oxygen segregated Nb(110) surface by photoelectron diffraction”, F. Matsui, M. Fujikado, H. Daimon, Czech. J. Phys. 56, (1) 61-68 (2006).

(123) “Atomic stereophotograph of intercalation compound Fe1/3NbS2”, F. Z. Guo, T. Matsushita, K. Kobayashi, F. Matsui, Y. Kato, H.Daimon, M.Koyano, Y.Yamamura, T. Tsuji, Y. Saitoh, Journal of applied physics 99, (2) 024907 (2006).

(124) Structure analysis of thin iron silicide film from Φ-scan RHEED Patterson function, O. Romanyuk, K. Kataoka, F. Matsui, K. Hattori, H. Daimon, Czech. J. Phys. 56, (3) 267-276 (2006).

(125) Ferroelectric Phase Transition Character of GlycinePhosphite, J. Nayeem, T. Kikuta, N. Nakatani , F. Matsui, S. Nishino Takeda, K. Hattori, H. Daimon, Ferroelectrics 332,(1) 13-19 (2006).

(126) Atomic Structure Analysis of Ultra Thin Fe Silicide Films by Stereo Atomscope, K.Kataoka, F.Matsui, Y.Kato, F.Z.Guo, T.Matsushita, K.Hattori, H.Daimon, Surface Review and Letters 13, (2-3) 209-214 (2006).

(127) “Adsorption and Reaction of Nitric Oxide on Si(111)-Au Surfaces”, T. Nishimura, K. Hattori , K. Kataoka, Y. Shimamoto, H. Daimon, Surface Review and Letters 13, (2-3) 191-196 (2006).

(128) “Chemisorption of L-cysteine on Au(111)/Si(111) and Si(111)√3-√3 - Au Surfaces”, M. Honda, F. Matsui, H. Daimon, Surface Review and Letters, 13, (2-3) 197-200 (2006).

(129) “Stereophotographs of diamond and graphite”, Y.Kato, F.Matsui, T.Shimizu, T.Matsushita, F.Z.Guo, T.Tsuno, H.Daimon, Science and Technology of Advanced Materials (STAM) 7, S45-S48, August (2006).

(130) “Approach for simultaneous measurement of two-dimensional angular distribution of charged particles. Ⅱ, Deceleration and focusing of wide-angle beams using a curved mesh lens", H. Matsuda, H. Daimon, Phys. Rev. E 74, (3) 036501-1-9 (2006)

(131) “Two-dimensional angle-resolved photoelectron spectroscopy using display analyzer ---Atomic orbital analysis and characterization of valence band”, H. Daimon, F. Matsui, Progress in Surface Science 81, (8-9) 367-386 (2006).

(132) “Iron silicides grown by solid phase epitaxy on a Si(111) surface: Schematic phase diagram”, K. Kataoka, K. Hattori, Y. Miyatake, H. Daimon, Phys. Rev. B 74,(15) 155406 (2006).

(133) “Photoelectron angular distribution of 2H-NbSe2 Studied by Display-Type Spherical Mirror Analyzer and Circularly Polarized Light”, F.Z.Guo, T.Matsushita, F.Matui, Y.Kato, H. Daimon,, Surface and Interface Analysis, 38, (12-13) 1604-1606 (2006).

(134) “Construction of Two-dimensional Photoelectron Spectroscopy Beamline at Rits SR Center for Investigation of Surface Electronic Structure”, Y. Hamada, F. Matsui, Y. Nozawa, K. Nakanishi, M. Nampei, K. Ogawa, S. Shigenai, N. Takahashi, H. Daimon, H.Namba, AIP Conf. Proc. 879, 547-550 (2006).

(135) “New Display-type Analyzer for Three-dementsional Fermi Surface Mapping and Atomic Orbital Analysis”, N. Takahashi, F. Matsui, H. Matsuda, S. Shigenai, Y. Hirama, Y. Hamada, K. Nakanishi, H. Namba, H. Daimon, AIP Conf. Proc. 879, 1180-1183 (2006).

(136) “A Real-Time Imaging System for Stereo Atomic Microscopy at SPring-8's BL25SU”, T. Matsushita, F. Z. Guo, T. Muro, F. Matsui, H. Daimon, AIP Conf. Proc. 879, 1164-1167 (2006).

(137) “Site-Specific Orbital Angular Momentum Analysis of Graphite Valence Electron Using Photoelectron Forward Focusing Peaks”, F. Matsui, T. Matsushita, Y. Kato, F.Z. Guo, H. Daimon, Journal of the Physical Society of Japan, 76, (1) 013705-1-4 (2007).

(138) “Three-dimentional atomic-arrangement reconstruction from an Auger-electron hologram”, T. Matsushita, F. Z. Guo, F. Matsui, Y. Kato, H. Daimon, Phys. Rev. B 75, (8) 085419-1-5 (2007).

(139) “Approach for simultaneous measurement of two-dimensional angular distribution of charged particles. Ⅲ. Fine forcusing of wide-angle beams in multiple lens systems”, H. Matsuda, H. Daimon, L. Toth, F. Matsui, Phys. Rev. E 75, (4) 046402-1-5 April (2007).

(140) “Circularly polarized X-ray photoelectron diffraction - Stereo photograph of atomic arrangement”, H. Daimon, F. Matsui, F. Z. Guo, T. Matsushita, J. Electron Spectrosc. Rel. Phenom., 156-158, 1-9 May (2007).

(141) Stereo Photography of atomic arrangement and atomic-orbital analysis by two-dimensional photoelectron spectroscopy, F. Matsui, T. Matsushita, F. Z. Guo, H. Daimon, Surf. Rev. Lett. 14, (4) 637-643 (2007)

(142) Fermi energy band dispersion and orbital symmetry of Bi2Sr2CaCu2Oy studied by non-polarized-light two-dimensional photoelectron spectroscopy, Chikako Sakai, Fumihiko Matsui, Nobuaki Takahashi, Sakura Nishino Takeda, Hiroshi Daimon, Physica C 467, (1-2) 43-50 August(2007).

(143) Stereo-PEEM for three-dimensional atomic and electronic structures of microscopic materials, H. Daimon, H. Matsuda, L. Toth, F. Matsui, Surface Science 601 (20) 4748-4753 (2007).

(144) Variety of iron silicides grown on Si(001) surfaces by solid phase epitaxy: Schematic phase diagram, H. Nakano, K. Maetani, K. Hattori, H. Daimon, Surface Science 601 (22) 5088-5092 November (2007).

(145) Three-dimensional elongated island of iron silicide grown on Si(001) surfaces by solid phase epitaxy, K. Maetani, H. Nakano, K. Hattori, H. Daimon, J. Phys. : Conf. Ser. 61, 409-413 (2007).

(146) β-FeSi2 thin film grown on a Si(111) surface with ferromagnetic interface, A. N. Hattori, K. Hattori, H. Daimon, Journal of Physics: Conference Series 61, 404-408, (2007).

(147) Depth resolved electronic structure of cuprate superconductor analyzed by two-dimensional X-ray Auger resonance emission spectroscopy, C. Sakai, F. Matsui, T. Matsushita, Y. Kato, T. Narikawa, H. Daimon, e-Journal of Surface Science and Nanotechnology 5, 143-147 (2007).

(148) Dopant-site effect in superconducting diamond (111) studied by atomic stereo-photography, Y. Kato, F.

Matsui, T. Shimizu, T. Matsushita , F. Z. Guo, T. Tsuno, H. Daimon, Appl. Phys. Lett. 91,(25) 251914, (2007).

(149) Formation of ferromagnetic interface between β-FeSi2 and Si(111) substrate, A. N. Hattori, K. Hattori, K. Kodama, N. Hosoito, H. Daimon, Appl. Phys. Lett. 91,201916-1-3 (2007)

(150) Total analysis of surface structure and properties by UHV transfer system, H. Yamatani, K. Hattori, T. Matsuta, T. Ito, T. Nohno, M. Hori, Y. Miyatake, S. Konno, T. Tanaka, Y. Hamada, H. Katagiri, M. Hibi, T. Miyai, M. Hashimoto, K. Kataoka, T. Tatsuta, A. N. Hattori, N. Higashi, M. Honda, N. Masunaga, H. Mino, S. Yasui, J. Nayeem,T. Shimizu, N. Takahashi, Y. Kato, C. Sakai, M. Yoshimura, S. N. Takeda, F. Matsui, H. Daimon, Surface Science 601 (22) 5284-5288 (2007).

(151) Observation of Multi-Step Ordering of Bi Adsorbed on the Si(111)7×7 Structure by RHEED and STM, Yohei Ohnishi, Sakura N. Takeda, Masaaki Yoshikawa, Hiroshi Daimon and Chikako Sakai, e Journal of Surface Science and Nanotechnology 6, 291-295 (2008)

(152) Orbital Angular Momentum of Iron Valence Band Electron Analyzed by Photoelectron Stereography, K. Goto, F. Matsui , Matsushita, Y. Kato, and H. Daimon, J. Phys. Soc. Jpn. 77, (10)103301 (2008).

(153) Reconstruction Algorithm for an Atomic-Resolution Holography using Translational Symmetry, T. Matsushita, F. Z. Guo, M. Suzuki, F. Matsui , H. Daimon, and K. Hayashi, Phys. Rev. B , 78 (14) 144111 (2008).

(154) Atomic orbitals and photoelectron intensity angular distributions of MoS2 valence band, Zs.Janosfalvi, F. Matsui , N. Takahashi, M. Akasaka, H. Namba, and H. Daimon, Appl. Surface Science 254, (23) 7679-7683 (2008)

(155) ARPES measurements on Si(1 1 1) hole subband induced by Pb and Ga adsorption, M. Morita, S.N. Takeda, M. Yoshikawa, A. Kuwakoa, Y. Kato and H. Daimon, Applied Surface Science 254, (23) 7872-7876 (2008).

(156) Circular dichroism of forward focusing peaks in 2πsteradian Si 2p photoelectron pattern, K.Inaji, F. Matsui, Y. Kato, C. Sakai, T. Narikawa, T. Matsushita, F. Z. Guo, H. Daimon, Appl. Surf. Sci. 254, (23) 7549-7552 (2008).

(157) X-ray photoelectron spectroscopy of SPE-grown bcc-Fe, polycrystal and b-FeSi2 phases on Si(111) surfaces, A.N. Hattori, K. Hattori, H. Daimon, Surf. and Interface Anal. 40, (6-7) 988-992 (2008).

(158) New Simple Photoemission Electron Microscope with an Energy Filter, L. Toth, H. Matsuda, T. Shimizu, F. Matsui , and H. Daimon, J. Vac. Soc. Jpn. 51, (3) 135-137 (2008).

(159) Atomic-Layer Resolved Magnetic and Electronic Structure Analysis of Ni Thin Film on a Cu(001) Surface by Diffraction Spectroscopy, F. Matsui, T. Matsushita, Y. Kato, M. Hashimoto, K. Inaji, F. Z. Guo, and H.Daimon, Phys. Rev. Lett. 100, (20) 207201 (2008).

(160) Improvement of Display-Type Spherical Mirror Analyzer for Real Space Mapping of Electronic and Atomic Structures, N. Takahashi, F. Matsui , Hiroyuki Matsuda, Yoji Hamada, Koji Nakanishi, Hidetoshi Namba and Hiroshi Daimon, J. Electron Spectrosc. Relat. Phenom. 163, (1-3) 45–50 (2008)

(161) Hole Subband Dispersion in Space Charge Layers under Pb/Si(001) Surfaces Measured by Angle-Resolved Photoelectron Spectroscopy, Y. Tanigawa, S. N. Takeda, M. Morita, T. Ohsugi, Y. Kato, H. Daimon, M. Yoshimaru and T. Imamura, e Journal of Surface Science and Nanotechnology 7,641-648 (2009)

(162) Stereophotograph of InP(001), T. Matsumoto, F. Matsui , T. Matsushita, K. Goto, Y. Kato, H. Daimon, e-J. Surf.Sci. Nanotech. 7,181-185 (2009)

(163) Growth of Fe silicides on Si(111) surfaces from bcc-Fe to fine-polycrystal and b-FeSi2 phases: Structure and magnetism, K. Hattori, Y. Murata, A.N. Hattori, and H. Daimon, Vacuum 84 (5) 648-652 (2009)

(164) Disentangling atomic-layer-specific x-ray absorption spectra by Auger electron diffraction spectroscopy, F. Matsui, T. Matsushita, Y. Kato, M. Hashimoto, H. Daimon, J. Phys. : Conf. Ser. Vol.190 No.1 012111 (2009)

(165) Apparent "three-dimensional" Fermi surface of transition-metal monolayers, O. Rader, H. Wolf, W. Gudat, A. Tadich, L. Broekman, E. Huwald, R.C.G. Leckey, J.D. Riley, A.M. Shikin, F. Matsui, H. Miyata, H. Daimon, Phys. Rev.B. Vol.79 Issue 24 245104(6 pages) June (2009)

(166) InferfaceStructure of an Epitaxial Iron Silicide on Si(111) Studied with X-ray Diffraction, T. Shirasawa, K. Sekiguchi, Y. Iwasawa, W. Voegeli, T. Takahashi, K. Hattori, A.N. Hattori, H. Daimon, Y. Wakabayashi, e Journal of Surface Science and Nanotechnology 7, 513-517 (2009)

(167) Simple method for making deeply curved mesh, Laszlo Toth,HiroyukiMatsuda,HiroshiDaimon, Journal of Electron Spectroscopy and Related Phenomena 171, (1-3) 64-67 (2009)

(168) Development of the Hard-X-ray Angle Resolved X-ray Photoemission Spectrometer for Laboratory Use, M. Kobata, I. Pis, H. Iwai, H. Yamazui, H. Takahashi, M. Suzuki, H. Matsuda, H. Daimon, K. Kobayashi, Analysical Sciences, 26(2), 227 (2010)

(169) Phase discrimination of iron-silicides on Si(001) surfaces by three-dimensional reciprocal-lattice mapping, M. Someta, K. Maetani, K. Hattori, and H. Daimon, Surf. Sci. 604, (1) 21-26 (2010)

(170) Photon energy dependence of graphite valence band photoelectron intensity, Masaru Takizawa, Hidetoshi Namba, Fumihiko Matsui, Hiroshi Daimon, Journal of Electron Spectroscopy and Related Phenomena 181, (2-3) 193-196 (2010),

(171) Chemical etchant dependence of surface structure and morphology on GaN(0001) substrates, A. N. Hattori, F. Kawamura, M. Yoshimura, Y. Kitaoka, Y. Mori, K. Hattori, H. Daimon, and K. Endo, Surface Science 604, (15-16) 1247-1253 August (2010)

(172) Atomic-layer-resolved analysis of surface magnetism by diffraction spectroscopy, F. Matsui, T. Matsushita, H. Daimon, Journal of Electron Spectroscopy and Related Phenomena 181, (2-3) 150-153 (2010)

(173) Effect of surface carrier concentration on valence subbands in Si(111) p-type inversion layers: Angle-resolved photoemission spectroscopy, Sakura Nishino Takeda, Naoto Higashi, Hiroshi Daimon, Phys. Rev. B 82, (3) 035318-1-5 (2010)

(174) Regular Array of L-Tyrosine Molecules on Si(111)-Au Superstructures, Masashi Yoshimura, Fumihiko Matsui, Hiroshi Daimon, e-J. Surf.Sci. Nanotech. 8, 303-308, (2010)

(175) Stereo atomscope and diffraction spectroscopy-Atomic site specific property analysis, Fumihiko Matsui, Tomohiro Matsushita and Hiroshi Daimon, Journal of Electron Spectroscopy and Related Phenomena 178-179, 221-240 (2010)

(176) Photoelectron holography with improved image reconstruction, Tomohiro Matsushita, Fumihiko Matsui,

Hiroshi Daimon and Kouichi Hayashi, Journal of Electron Spectroscopy and Related Phenomena 178-179, 195-220 (2010)

(177) Surface treatments toward obtaining clean GaN(0001) from commercial hydride vapor phase epitaxy and metal-organic, chemical vapor deposition substrates in ultrahigh vacuum, A. N. Hattori, K. Endo, K. Hattori, and H. Daimon, Applied Surface Science 256, (14) 4745-4756 (2010)

(178) Site-Specific Stereograph of SiC(0001) Surface by Inverse Matrix Method, F. Matsui , N. Nishikayama, N. Maejima, H. Matsui, K. Goto, M. Hashimoto, T. Hatayama, T. Matsushita, Y. Kato, H. Daimon, J. Phys. Soc. Jpn. 80, (1) 013601, (2011)

(179) Formation of step-state bands on Si(111) $\sqrt{3} \times \sqrt{3}$-Ag vicinal surfaces, H. Minoda, H. Yazawa, M. Morita, S. N. Takeda, and H. Daimon, PHYSICAL REVIEW B 83, (3) 035419-1-7 (2011)

(180) Formation of wide and atomically flat graphene layers on ultra precision-figured 4H-SiC(0001) surface, A. N. Hattori, T. Okamoto, S. Sadakuni, J. Murata, K. Arima, Y. Sano, K. Hattori, H. Daimon, K. Endo, and K. Yamauchi, Surface Science 605, (5-6) 597-605 (2011)

(181) Reconstruction Algorithm for Atomic Resolution Holography, T. Matsushita, F. Matsui , H. Daimon, K. Hayashi, e-J. Surf.Sci. Nanotech. 9, 153-157, (2011)

(182) Direct imaging of three-dimensional atomic arrangement by stereophotography using two-dimensional photoelectron spectroscopy, H. Daimon, F. Matsui , T. Matsumoto, K. Goto, Y. Kato, T. Matsushita, Nucl. Inst. Meth. Phys. Research Sec. A 648, S139-S141 (2011)

(183) New 1πsr acceptance angle display-type ellipsoidal mesh analyzer for electron energy and two-dimensional angular distribution as well as imaging analysis, L. Toth, K. Goto, H. Matsuda, F. Matsui, H. Daimon, Nucl. Inst. Meth. Phys. Research Sec. A 648, S58-S59 (2011)

(184) Development of Display-Type Ellipsoidal Mesh Analyzer, K. Goto, H. Matsuda, M. Hashimoto, H. Nojiri, C. Sakai, F. Matsui , H. Daimon, L. Tóth, T. Matsushita, e-J. Surf. Sci. Nanotech. 9, 311-314 (2011)

(185) Identifying valence band structure of transient phase in VO2 thin film by hard x-ray photoemission, T. Kanki, H. Takami,S. Ueda, A.N. Hattori, K. Hattori, H. Daimon,K. Kobayashi, and H. Tanaka, Phys. Rev. B 84, (8) 085107 1-5 (2011)

(186) Structure and magnetic properties of mono- and bi-layer graphene films on ultraprecision figured 4H-SiC(0001) surfaces, A. N. Hattori, T. Okamoto, S. Sadakuni, J. Murata, H. Oi, K. Arima, Y. Sano, K. Hattori, H. Daimon, K. Endo, and K. Yamauchi, Journal of Nanoscience and Nanotechnology 11, (4) 2897-2902 (2011)

(187) Self-Assembled Growth of Spinel (Fe, Zn)3O4-Perovskite ViFeO3 Nanocomposite Structures Using Pulsed Laser Deposition, Takuya Sakamoto, Azusa N. Hattori, Teruo Kanki, Ken Hattori, Hiroshi Daimon, Hiroyuki Akinaga, and Hidekazu Tanaka, Japan Journal of Applied Physics 51, 035504(4 pages), (2012)

(188) Details of 1πsr wide acceptance angle electrostatic lens for electron energy and two-dimensional angular distribution analysis combined with real space imaging, L. Toth, H. Matsuda, F. Matsui , K. Goto, H. Daimon, Nucl. Inst. Meth. Phys. Research Sec. A 661, (1) 98-105 (2012)

(189) Negative Photoelectron Diffraction Replica in Secondary Electron Angular Distribution, Fumihiko Matsui,

Tomohiro Matsushita, Mie Hashimoto, Kentaro Goto, Naoyuki Maejima, Hirosuke Matsui, Yukako Kato, Hiroshi Daimon, J. Phys. Soc. Jpn. 81, (1) 013601(4pages), (2012)

(190) Photoelectron Diffraction and Holographic Reconstruction of Graphite, Fumihiko Matsui, Tomohiro Matsushita, Hiroshi Daimon, J. Phys. Soc. Jpn. 81, 114604 (9 pages), (2012)

(191) Three-Dimensional Reciprocal-Lattice Analysis Using Azimuth-Sccan Reflection High-Energy Electron Diffraction: Determination of Complex Crystal Orientations of Al Grains of Si(111) Surface, K. Hattori, H. Oi, K. Tanaka, T. Kumagai, H. Daimon, Japan Journal of Applied Physics 51, 055801(5pages), (2012)

(192) Characterizing Edge and Stacking Structures of Exfoliated Graphene by Photoelectron Diffraction, F. Matsui, R. Ishii, H. Matsuda, M. Morita, S. Kitagawa, T. Matsushita, S. Koh, H. Daimon, Jpn. J. Appl. Phys. 52, No.11, Issue 1, 110110(5pages), (2013)

(193) Analysis of electronic structure of amorphous InGaZnO/SiO2 interface by angle-resolved X-ray photoelectron spectroscopy, Y. Ueoka, Y. Ishikawa, N. Maejima, F. Matsui, H. Matsui, H. Yamazaki, S. Urakawa, M. Horita, H. Daimon and Y. Uraoka, J. Appl. Phys. Vol.114, No.16, 163713 (2013)

(194) Element Assignment for Three-Dimensional Atomic Imaging by Photoelectron Holography, T. MATSUSHITA, F. MATSUI, K. GOTO, T. MATSUMOTO, H. DAIMON, J. Phys. Soc. Jpn. 82 114005(5 pages) (2013)

(195) Development of High Lateral and Wide Angle Resolved Hard X-ray Photoemission Spectroscopy at BL47XU in SPring-8, Eiji Ikenaga, Masaaki Kobata, Hiroyuki Matsuda, Takeharu Sugiyama, Hiroshi Daimon, and Keisuke Kobayashi, Journal of Electron Spectroscopyand Related Phenomena 190 Part B, Page 180-187, (2013)

(196) System to measure accurate temperature dependence of electric conductivity down to 20 K in ultrahigh vacuum, C. Sakai, S. N. Takeda, H. Daimon, Rev. Sci. Instrum. 84, 075103(6 pages), (2013)

(197) Atomic Structure and Catalytic Activity of W-Modified Ni2P Surface Alloy by Photoelectron Diffraction and Spectroscopy, Hirosuke Matsui, Fumihiko Matsui, Naoyuki Maejima, Hiroshi Daimon, Tomohiro Matsushita, Hiroko Ariga, Kiyotaka Asakura, e-J. Surf. Sci. Nanotech. Vol. 12, 53-56, (2014)

(198) The Influence of Fluorinated Silicon Nitride Gate Insulator on Positive Bias Stability toward Highly Reliable Amorphous InGaZnO Thin-Film Transistorsm H. Yamazaki, Y. Ishikawa, M. Fujii, Y. Ueoka, M. Fujiwara, E. Takahashi, Y. Andoh, N. Maejima, H. Matsui, F. Matsui, H. Daimon, Y. Uraoka, ECS Journal of Solid State Science and Technology, Vol. 3, Issue 2, Q20-Q23 (2014)

(199) Enhancement of photoluminescence efficiency from GaN(0001)by surface treatments, Azusa N. Hattori, Ken Hattori, Yuta Moriwaki, Aishi Yamamoto, Shu Sadakuni, Junji Murata, Kenta Arima, Yasuhisa Sano, Kazuto Yamauchi, Hiroshi Daimon, Katsuyoshi Endo, Jpn. J. Appl. Phys. Vol.53, No.2, 02100 (5 pages), (2014)

(200) Lattice Distortion of Porous Si by Li Absorption Using Two-Dimensional Photoelectron Diffraction, El Said A. Nouh, Sakura N. Takeda, Fumihiko Matsui, Ken Hattori, Tomohiro Sakata, Naoyuki Maejima, Hirosuke Matsui, Hiroyuki Matsuda, Tomohiro Matsushita, László Tóth, Makoto Morita, Satoshi Kitagawa, Ryo Ishii, Masayoshi Fujita, Kaoru Yasuda, Hiroshi Daimon, Journal of Materials Science, 49, Issue 1, 35-42, (2014)

(201) Surface structure and electronic states of epitaxial β-FeSi2(100)/Si(001) thin films: Combined quantitative

LEED, ab initio DFT, and STM study, O. Romanyuk, K. Hattori, M. Someta, H. Daimon, Phys. Rev. B Vol. 90 Issue 15, 155305(1-9), (2014)

(202) Electron-hole recombination on ZnO(0001) single-crystal surface studied by time-resolved soft X-ray photoelectron spectroscopy, R. Yukawa, S.Yamamoto, K. Ozawa, M.Emori, M.Ogawa, Sh. Yamamoto, K.Fujukawa, R.Hobara, S.Kitagawa, H.Daimon, H.Sakama, I.Matsuda, Applied Physics Letters Vol.105, No.15, 151602(1-4), (2014)

(203) Evaluation of disturbing effect of mesh holes in wide-acceptance-angle electrostatic mesh lensesm Hiroyuki Matsuda, László Tóth, Fumihiko Matsuia, Hiroshi Daimon, Journal of Electron Spectroscopy and Related Phenomena 195, 78–84, (2014)

(204) Development of display-type ellipsoidal mesh analyzer: Computational evaluation and experimental validation, H. Matsuda K. Goto L. Toth M. Morita S. Kitagawa, F. Matsui M. Hashimoto C. Sakai T. Matsushita H. Daimon, Journal of Electron Spectroscopy and Related Phenomena 195, Page 382-398, (2014)

(205) Photoelectron structure factor and diffraction spectroscopy, Fumihiko Matsui, Tomohiro Matsushita, Hiroshi Daimon, Journal of Electron Spectroscopy and Related Phenomena Vol.195 Page 347-360, (2014)

(206) Systematic study of surface magnetism in Si(111)–Fe system grown by solid phase epitaxy: In situ schematic magnetic phase diagram of Si(111)–Fe, Azusa N. Hattori, Ken Hattori, Keita Kataoka, Emi Takematsu, Akira Ishii, Fumio Komori, Hiroshi Daimon, Journal of Magnetism and Magnetic Materials, Volume 363, Pages 158-165, (2014)

(207) Site-Specific Atomic and Electronic Structure Analysis of Epitaxial Silicon Oxynitride Thin Film on SiC(0001) by Photoelectron and Auger Electron Diffractions, Naoyuki Maejima, Fumihiko Matsui, Hirosuke Matsui, Kentaro Goto, Tomohiro Matsushita, Satoru Tanaka, Hiroshi Daimon, J. Phys. Soc. Jpn. 83, Issue 4, 044604 (5 Pages) (2014)

(208) Effect of the Flash Annealing on the Impurity Distribution and the Electronic Structure in the Inversion Layer, Tomohiro Sakata, Sakura N. Takeda, Nur Idayu Ayob, Hiroshi Daimon, e-J. Surf. Sci. Nanotech. Vol. 13 75-78, (2015)

(209) Cubic Zirconia Crystalline Surface Oxide Epitaxial Formation on ZrB2(0001) Confirmed by Circularly-Polarized-Light Photoelectron Diffraction, Rie Horie, Fumihiko Matsui, Naoyuki Maejima, Hirosuke Matsui, Kota Tanaka, Hiroshi Daimon, e-J. Surf. Sci. Nanotech. Vol. 13, 111-114, (2015)

(210) Selective Detection of Angular-Momentum-Polarized Auger Electrons by Atomic Stereography, Fumihiko Matsui, Masayoshi Fujita, Takuya Ohta, Naoyuki Maejima, Hirosuke Matsui, Hiroaki Nishikawa, Tomohiro Matsushita, and Hiroshi Daimon, Phys. Rev. Lett. 114, 015501(1-4), (2015)

(211) Local atomic configuration of graphene, buffer layer, and precursor layer on SiC(0001) by photoelectron diffraction, Hirosuke Matsui, Fumihiko Matsui, Naoyuki Maejima, Tomohiro Matsushita, Takeshi Okamoto, Azusa N. Hattori, Yasuhisa Sano, Kazuto Yamauchi, Hiroshi Daimon, Surface Science 632, 98-102, ,(2015)

(212) Temperature Dependence of Magnetically Active Charge Excitations in Magnetite across the Verwey Transition, M. Taguchi, A. Chainani, S. Ueda, M. Matsunami, Y. Ishida, R. Eguchi, S. Tsuda, Y. Takata, M. Yabashi, K. Tamasaku, Y. Nishino, T. Ishikawa, H. Daimon, S. Todo, H. Tanaka, M. Oura, Y. Senba, H. Ohashi, and S. Shin, Phys. Rev. Lett. 115, 256405(1-5), (2015)

(213) Atomic-Orbital Analysis of ZrB2 Valence-Band by Two-Dimensional Photoelectron Spectroscopy, Rie Horie, Fumihiko Matsui, Hiroshi Daimon, Masaru Takizawa, Hidetoshi Namba, Shigeki Otani, Takashi Aizawa, e-J. Surf. Sci. Nanotech. Vol. 13, 324-328, (2015)

(214) Stacking registry determination of graphene grown on the SiC(0001) by photoelectron holography, Hirosuke Matsui, Fumihiko Matsui, Naoyuki Maejima, Tomohiro Matsushita, Hiroshi Daimon, Surface Science 635, 1-4, (2015)

(215) Unusual energy separation of subbands in Si(111) p-channels induced by In adsorption, Nur Idayu Ayob, Sakura N. Takeda, Tomohiro Sakata, Masaaki Yoshikawa, Makoto Morita and Hiroshi Daimon, Jpn. J. Appl. Phys. Vol.54 No.6 065702 (2015)

(216) Molecule desorption induced by gate-voltage application in MOS structure, Nozomu Hirota, Ken Hattori, Hiroshi Daimon, Azusa N. Hattori and Hidekazu Tanaka, Applied Physics Express, Vol.9, No.4, 047002(1-4), (2016)

(217) Disentangling hole subbands dispersion in Si(111): In- and out-of-plane effective masses and anisotropy, Sakura Nishino Takeda, Atsushi Kuwako, Masahiro Nishide, and Hiroshi Daimon, Phys. Rev.B 93. 125418, (2016)

(218) Creation of atomically flat Si{111}7X7 side-surfaces on a three-dimensionally-architected Si(110) substrate, A. N. Hattori, K. Hattori, S. Takemoto, H. Daimon, and H. Tanaka, Surf. Sci., Vol 64, pp86–90, (2016)

(219) Interband interaction between bulk and surface resonance bands of a Pb-adsorbed Ge(001) surface, Tomohiro Sakata1, Sakura N Takeda1, Kosuke Kitagawa and Hiroshi Daimon, Semiconductor Science and Technology, Vol. 31, No. 8, 085012 (2016)

(220) Interfacial atomic site characterization by photoelectron diffractionfor 4H-AlN/4H-SiC(11□20) heterojunction, Naoyuki Maejima, Masahiro Horita, Hirosuke Matsui, Tomohiro Matsushita, Hiroshi Daimon, and Fumihiko Matsui, Jpn. J. Appl. Phys. Vol.55, No.8, 085701(1-5) (2016)

(221) Methods of creating and observing atomically reconstructed vertical Si{100}, {110}, and {111} side surfaces, A. N. Hattori, S. Takemoto, K. Hattori, H. Daimon, H. Tanaka, Appl. Phys. Express, Vol.9, No.8, 085501-1-4 (2016)

(222) Circular Dichroism in Cu Resonant Auger Electron Diffraction, F. Matsui, N. Maejima, H. Matsui, H. Nishikawa, H. Daimon, T. Matsushita, M. Muntwiler, R. Stania, Roland , T. GreberZeitschrift für Physikalische Chemie, vol.230, Issue 4, p519(2016)

(223) Enhancements of photoluminescence intensity in high-quality floating-zone Si by thermal annealing in vacuum, Keita Kataoka, Ken Hattori, Aishi Yamamoto, Azusa Nakamoto Hattori, Tomoaki Hatayama, Yasuji Kimoto, Katsuyoshi Endo, Takashi Fuyuki, and Hiroshi Daimon, JJAP Rapid Communication, Vol. 55, 11308 (1-4) (2016). http://doi.org/10.7567/JJAP.55.110308

(224) Bi induced superstructures on Si(110), Artoni Kevin R. Ang, Sakura Nishino Takeda, Hiroshi Daimon, J. Vac. Sci. Technol. A 34, 051401 (June 2016). http://dx.doi.org/10.1116/1.4958803

(225) Photoelectron Holographic Atomic Arrangement Imaging of Cleaved Bimetal-intercalated Graphite Superconductor Surface, Fumihiko Matsui, , Ritsuko Eguchi,, Saki Nishiyama, Masanari Izumi, Eri Uesugi, Hidenori Goto, Tomohiro Matsushita,, Kenji Sugita, Hiroshi Daimon, Yuji Hamamoto, Ikutaro Hamada, Yoshitada

Morikawa, Yoshihiro Kubozono, Scientific Reports 6, 36258 (2016). doi:10.1038/srep36258

(226) Electronic structure and correlation in β-Ti3O5 and λ-Ti3O5 studied by Hard X-ray Photoelectron Spectroscopy, Keisuke Kobayashi, Munetaka Taguchi, Masaaki Kobata, Kenji Tanaka, Hiroko Tokoro, Hiroshi Daimon, Tetsuo Okane, Hiroshi Yamagami, Eiji. Ikenaga, Shin-ichi Ohkoshi, Physical Review B. 085133 (2017).

(227) Unusual coexistence of negative and positive charge transfer in mixed-valence NaxCa1−xCr2O4, M. Taguchi, H. Yamaoka, Y. Yamamoto, H. Sakurai, N. Tsujii, M. Sawada, H. Daimon, K. Shimada, and J. Mizuki, Phys. Rev. B 96, 245113 (2017)

(228) Realization of software based imaging energy analyzer on GPU, Laszlo Levente Toth, Adam Fazekas, Hiroyuki Matsuda, Hiroshi Daimon, Laszlo Toth, Optik International Journal for Light and Electron Optics (2017)

(229) Direct observation for atomically flat and ordered vertical {111} side-surfaces on three-dimensionally figured Si(110) substrate using scanning tunneling microscopy, Haoyu Yang, Azusa N. Hattori, Akinori Ohata, Shohei Takemoto, Ken Hattori, Hiroshi Daimon, Hidekazu Tanaka, Japanese Journal of Applied Physics 56, 111301 (2017).

(230) Quantifying the critical thickness of electron hybridization in spintronics materials, T. Pincelli, V. Lollobrigida F. Borgatti, A. Regoutz, B. Gobaut, C. Schlueter, T.-L. Lee, D.J. Payne, M. Oura, K. Tamasaku, A.Y. Petrov, P. Graziosi, F. Miletto Granozio,, M. Cavallini, G. Vinai, R. Ciprian, C.H. Back, G. Rossi, M. Taguchi, H. Daimon, G. van der Laan & G. Panaccione, NATURE COMMUNICATIONS 8 16051 (2017). DOI: 10.1038/ncomms16051

(231) Correlation between high gas sensitivity and dopant structure in W-doped ZnO, Shun Fukami, Munetaka Taguchi, Yuu Adachi, Ken Watanabe, Toyohiko Kinoshita, Takayuki Muro, Tomohiro Matsushita, Fumihiko Matsui, Hiroshi Daimon, and Taku T. Suzuki, Physical Review Applied 7, 064029 (2017).

(232) Lattice distortion and electronic structure of magnesium-doped nickel oxide epitaxial thin films, Yanna Chen, Osami Sakata, Ryosuke Yamauchi, Anli Yang, Loku Singgappulige Rosantha Kumara, Chulho Song, Natalia Palina, Munetaka Taguchi, Toshiaki, Ina, Yoshio Katsuya, Hiroshi Daimon, Akifumi Matsuda, and Mamoru Yoshimoto, Physical Review B 95.245301(1-10) (2017). DOI: 10.1103/PhysRevB.95.245301

(233) Noble Metal Nanocluster Formation in Epitaxial Perovskite Thin Films, Mihee Lee, Rémi Arras, Ryota Takahashi, Bénédicte Warot-Fonrose, Hiroshi Daimon, Marie-José Casanove, and Mikk Lippmaa, ACS Omega, 2018, 3 (2), pp 2169–2173 (2018). DOI: 10.1021/acsomega.7b02071

(234) YBa2Cu3Ox superconducting nanorods, William Rieken, Atit Bhargava, Rie Horie, Jun Akimitsu, and Hiroshi Daimon, Japanese Journal of Applied Physics 57, 023101 (2018).

(235) Variable-deceleration-ratio wide-acceptance-angle electrostatic lens for two-dimensional angular and energy analysis, Hiroyuki Matsuda, László Tóth, and Hiroshi Daimon, Review of Scientific Instruments 89, 123105 (2018). https://doi.org/10.1063/1.5043317

(236) Distortion analysis of Ir- and Co-doped LaAlO_3/SrTiO_3 (001) interfaces by hard X-ray photoelectron diffraction, Mihee Lee, Xin Liang Tang, Mitsutoshi Yoneda, Takashi Okamoto, Ikko Tanaka, Yudai Higa, Dawei Peng, Masafumi Ogi, Shinta Kobayashi, Munetaka Taguchi, Mikk Lippmaa, Marie-Jose Casanove, Hiroshi Daimon, J. Phys. Soc. Jpn., Vol.87, No.8, Article ID: 084601(2018). DOI: 10.7566/JPSJ.87.084601

(237) Electric transport properties for three-dimensional angular-interconnects of Au wires crossing facet edges of atomically-flat Si{111} surfaces, Shohei Takemoto, Azusa Hattori, Ken Hattori, Hidekazu Tanaka, and Hiroshi Daimon, Japanese Journal of Applied Physics, 57, 090303 (2018).

(238) Site-Sensitive X-ray Photoelectron Spectroscopy of Fe3O4 by Photoelectron Diffraction, Yusuke Hashimoto, Munetaka Taguchi, Shun Fukami, Hiroki Momono, Tomohiro Matsushita, Hiroyuki Matsuda, Fumihiko Matsui, Hiroshi Daimon, Surface and Interface Analysis 51, 115–119 (2019). DOI: 10.1002/sia.6568

(239) Overview of Three-Dimensional Atomic-Resolution Holography and Imaging Techniques: Recent Advances in Local-Structure Science, Hiroshi Daimon, J. Phys. Soc. Jpn., 87, 061001 (2018). DOI: 10.7566/JPSJ.87.061001

(240) Three-dimensional atomic arrangement around active/inactive dopant sites in boron-doped diamond, Yukako Kato, Daichi Tsujikawa, Yusuke Hashimoto, Taisuke Yoshida, Shun Fukami, Hiroyuki Matsuda, Munetaka Taguchi, Tomohiro Matsushita, and Hiroshi Daimon, Applied Physics Express 11, 061302-1～061302-3 (2018).

(241) Tensile-Strain-Dependent Spin States in Epitaxial LaCoO3 Thin Films, Y. Yokoyama, Y. Yamasaki, M. Taguchi, Y. Hirata, K. Takubo, J. Miyawaki, Y. Harada, D. Asakura, J. Fujioka, M. Nakamura, H. Daimon, M. Kawasaki, Y. Tokura, H. Wadati, Physical Review Letters, 120, 206402-1～206402-5 (2018). DOI: 10.1103/PhysRevLett.120.206402

(242) Disorder and mixed valence properties of Sr2FeMoO6 studied by photoelectron diffraction and x-ray absorption spectroscopy, Munetaka Taguchi, Fumihiko Matsui, Naoyuki Maejima, Hirosuke Matsui, Hiroshi Daimon, Surface Science, 683, 53-56 (2019). https://doi.org/10.1016/j.susc.2019.02.001