

APPENDIX

ORGANIZATION

Staff

Director

Katsumi	KIMURA	Professor (-March 1992)
Kyuya	YAKUSHI	Professor (April 1992-)

Scientific Staff

Light Source

Goro	ISOYAMA	Associate Professor
Hiroyuki	HAMA	Research Associate
Shirou	TAKANO	Research Associate (-March 1992)

Beam Line

Makoto	WATANABE	Associate Professor
Masao	KAMADA	Associate Professor
Atsunari	HIRAYA	Research Associate
Shin-ichiro	TANAKA	Research Associate
Shigeo	OHARA	IMS Fellow (April 1992-)

Technical Staff

Kusuo	SAKAI	Section Chief Engineer
Osamu	MATSUDO	Unit Chief Engineer
Toshio	KINOSHITA	Engineer
Masami	HASUMOTO	Engineer
Jun-ichiro	YAMAZAKI	Engineer
Eiken	NAKAMURA	Engineer

Secretary

Eiko	ADACHI	(-June 1992)
Hisayo	HAGIWARA	(July 1992-)

Guest Scientist

Eiji	ISHIGURO	Adjunct Associate Professor from Osaka City Univ.
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Graduate Student

Sayumi	HIROSE
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Representative of Beam Lines

BL1A	Makoto	WATANABE	UVSOR
BL2A	Kosuke	SHOBATAKE	Dept. Vacuum UV Photoscience
BL2B2	Koichiro	MITSUKE	Dept. Vacuum UV Photoscience
BL3B	Koichiro	MITSUKE	Dept. Vacuum UV Photoscience
BL4A	Shinri	SATO	Dept. Vacuum UV Photoscience

BL4B	Tsuneo	URISU	Dept. Vacuum UV Photoscience
BL6B	Kyuya	YAKUSHI	Dept. Molecular Assemblies
BL6A2	Masao	KAMADA	UVSOR
BL8B2	Hiroo	INOKUCHI	IMS
Others	Makoto	WATANABE	UVSOR
	Masao	KAMADA	UVSOR

Steering Committee (April 1992 – March 1994)

Kyuya	YAKUSHI	IMS	Chairman
Masahiro	KOTANI	Gakushuin Univ.	
Kaizo	NAKAMURA	Okayama Univ.	
Yukinori	SATO	Tohoku Univ.	
Noriaki	ITOH	Nagoya Univ.	
Akito	KAKIZAKI	Tokyo Univ.	
Toshio	KASUGA	Hiroshima Univ.	
Tadashi	MATSUSHITA	Nat. Lab. High Energy Phys.	
Eiji	ISHIGURO	IMS and Osaka City Univ.	
Keitaro	YOSHIHARA	IMS	
Norio	MORITA	IMS	
Koichiro	MITSUKE	IMS	
Makoto	WATANABE	IMS	
Goro	ISOYAMA	IMS	
Masao	KAMADA	IMS	

JOINT STUDIES (fiscal year 1992)

Special Project	: 2
Cooperative Research	: 39
Cooperative Research (Invited)	: 7
Use of Facility	: 107
Use of Facility (Private Company)	: 3
Users' Meeting	: 1
Workshop on Beam Dynamics and Free Electron Laser	: 1
Users' Time	: 43 weeks

LIST OF PUBLICATIONS (1992)

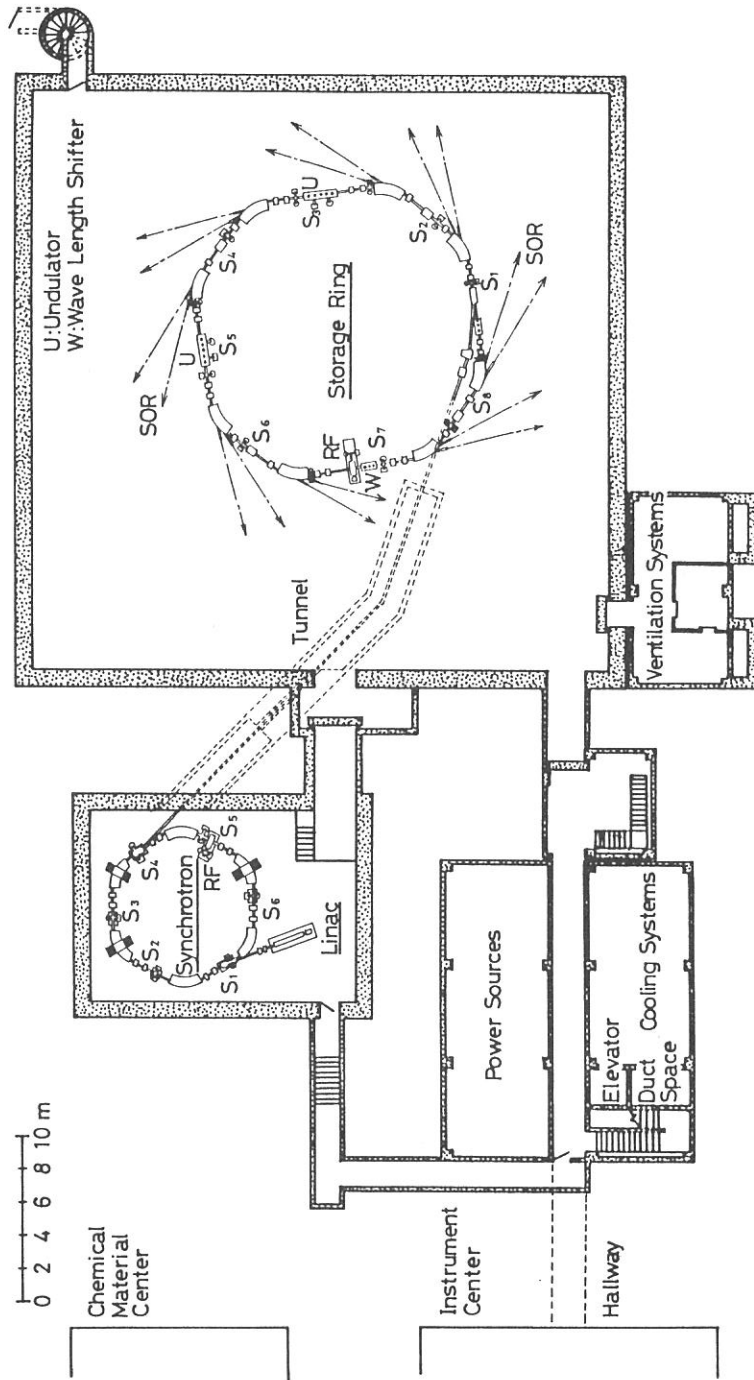
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J. Lumi. **48 & 49** (1991) 807.
- 2) "Low Temperature Growth of SiO_2 Thin Film by Photo-CVD Using Synchrotron Orbital Radiation"
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- 3) "Structural Modification of a-C:H Films Caused by 2 MeV 4He Ion Irradiation"
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- 4) "Cubic Boron Nitride Prepared by an ECR Plasma"
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- 5) "Energy Partitioning in the Dissociation Reaction $Ar_3^+ \rightarrow Ar_2^+ + Ar$ "
K. Furuya, K. Kimura and T. Hirayama
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- 6) "Millimeter Wave Spectroscopy and Color Centers of MAg_4I_5 (M=Rb, K and NH_4) Family"
T. Awano, T. Nanba and M. Ikezawa
Solid State Ionics **53-56** (1992) 1269.
- 7) "Gain Measurement of a Free Electron Laser on the UVSOR Storage Ring"
S. Takano, H. Hama, G. Isoyama, A. Lin and N. A. Vinokurov
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- 8) "Negative-Ion Mass Spectrometric Study of Ion-Pair Formation in the Vacuum Ultraviolet. VI.
 $CH_3X \rightarrow X^- + CH_3^+$ (X=F, Cl, Br)"
S. Suzuki, K. Mitsuke, T. Imamura and I. Koyano
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- 9) "Characterization of Platinum-Carbon, Tungsten-Silicon and Tungsten- B_4C Multilayers"
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- 10) "Characterization of Multilayer Reflectors and Position Sensitive Detectors in the 45-300 Å Region"
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M. Sakurai, M. Watanabe, A. Yamaguchi, H. Nagata and M. Ohtani
Rev. Sci. Instrum. **63** (1992) 1513.

- 11) "Soft X-Ray Beamline BL7A at the UVSOR"
T. Murata, T. Matsukawa, S. Naoé, T. Horigome, O. Matsudo and M. Watanabe
Rev. Sci. Instrum. **63** (1992) 1309.
- 12) "Status of the UVSOR Facility-1991"
M. Watanabe, G. Isoyama, M. Kamada and K. Kimura
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- 13) "Fabrication and Characterization of Reactive Ion Beam Etched SiC Gratings"
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M. Koeda and T. Nagano
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- 14) "Photoelectron Spectroscopic Study of the Decay Process of Excited $4d$ States in Cesium Halides"
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- 15) "Design of an Instrument for Far-Infrared Microspectroscopy Using a Synchrotron Radiation Source"
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- 16) "Measurement of the Bunch Length on the UVSOR Storage Ring"
A. Lin, H. Hama, S. Takano and G. Isoyama
Jpn. J. Appl. Phys. **31** (1992) 921.
- 17) "Self-Trapped Exciton Luminescence in $\text{KBr}_{1-x}\text{I}_x$ and $\text{RbBr}_{1-x}\text{I}_x$ Solid Solutions"
T. Hayashi, T. Yanase, T. Matsumoto, K. Kanno, K. Toyoda and Y. Nakai
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- 18) "Resonant Photoemission Study of the Al-Cu-Fe Icosahedral Phase"
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- 19) "Vacuum Ultraviolet Absorption Spectra and Photodissociative Excitation of CHBr_2Cl and CHBrCl_2 "
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- 20) "Core Absorption Spectra of SnTe and PbTe in Crystalline and Amorphous Phases"
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- 21) "UV Photoemission Studies on PbTe, SnTe and GeTe in Polycrystalline and Amorphous Phases"
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- 22) "State Selective Ionization of O₂ in a Framework of van der Waals Molecules"
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- 24) "Trapping and Probing of Multiply Charged Xe Ions Produced by Synchrotron Radiation"
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- 25) "Fast Decay Behaviors of Self-Trapped Exciton Luminescence in Ammonium Halides"
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- 26) "Focusing and Imaging Properties of a Nickel Phase Zone Plate"
H. Fujisaki, N. Nakagiri, H. Kihara, N. Watanabe, Y. Shimanuki and Y. Nagai
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- 27) "Construction of Focusing Soft X-Ray Beamline BL1A at the UVSOR"
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- 28) "Electronic Structure of Bis [1,2,5,] thiadiazolo-*p*-quinobis (1,3-dithiole) (BTQBT) Studied by Ultraviolet Photoemission Spectroscopy"
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- 30) "Pseudo-Gap and Electronic Structure Near the Fermi Level in Doped C₆₀"
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- 31) "Time-Resolved Spectroscopic Study on the Type I Self-Trapped Excitons in Alkali Halide Crystals. I. Emission Spectra and Decay Behavior"
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- 32) "Kinetic-Energy Release in the Dissociative Double Photoionization of OCS"
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- 33) "Observation of Wet Biological Specimen by Soft X-Ray Microscope with Zone Plates at UVSOR"
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- 34) "Low Energy Electronic State and Optical Phonon in YbB₆"
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- 35) "Ultraviolet Photoelectron Spectra of C₈₄ and K_xC₈₄"
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- 37) "Orientation of Oxygen Admolecules on a Reconstructed Platinum(110)(1×2) Surface: a Near-Edge X-Ray-Absorption Fine-Structure Study"
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- 38) "Low-Temperature Growth of SiO₂ Thin Film by Photo-Induced Chemical Vapor Deposition Using Synchrotron Radiation"
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- 39) "X-Ray Microscope with Grazing Incidence Mirrors and a High Resolution X-Ray Imaging Apparatus"
S. Ohsuka, A. Ohba, M. Sugiyama, T. Hayakawa, T. Matsumura, K. Kinoshita, N. Watanabe, Y. Shimanuki, Y. Sano and H. Kihara
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- 40) "Comparative Photoemission Study of Rb_xC₆₀, Rb_xC₇₀ and RbC₈. A Pseudo-Gap at the Fermi Level in the Fulleride"
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- 41) "Stimulated Ultraviolet Emission from BaF₂ under Core-Level Excitation with Undulator Radiation"
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- 42) "Vacuum-Ultraviolet-Light-Induced Defects in Hydrogenated Amorphous Silicon Films"
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- 43) "Carbon K-Edge XANES and EXAFS of C₆₀, C₇₀, and K₃C₆₀"
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- 44) "Preparation and Characterization of Platinum-Carbon Multilayers"
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- 45) "Structure and Reactivity of MoO₃-MgO Catalysts"
S. Hasegawa, T. Tanaka, M. Kudo, H. Mamada, H. Hattori and S. Yoshida
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- 46) "Optical Properties of Silica Glasses Having O₂ and Cl₂ Molecules"
K. Awazu, H. Kawazoe and K. Muta
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- 47) "Structural Imperfections in Silica Glasses with an Optical Absorption Peak at 3.8 eV"
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J. Appl. Phys. **72** (1992) 4696.
- 48) "Soft X-Ray Microscopy with Zone Plates at UVSOR"
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Ground plan of the basement of the UVSOR Facility

Table 1. Main Parameters of the UVSOR Accelerator Complex

Linac

Energy	$E = 15 \text{ MeV}$
Frequency	$f_{\text{RF}} = 2.856 \text{ GHz}$

Synchrotron

Energy	$E = 600 \text{ MeV}$
Beam Current	$I = 32 \text{ mA}$
Circumference	$C = 26.6 \text{ m}$
Superperiodicity	$N_{\text{superperiodicity}} = 6$
Bending Radius	$\rho = 1.8 \text{ m}$
Harmonic Number	$h = 8$
RF Frequency	$f_{\text{RF}} = 90.115 \text{ MHz}$
Repetition Rate	$f_{\text{rep}} = 2.6 \text{ Hz}$

Storage Ring

Energy	$E = 750 \text{ MeV}$
Critical Energy of SR	$\epsilon_C = 425 \text{ eV}$
Beam Current (Nominal)	
Multi-Bunch	$I = 200 \text{ mA}$
Single-Bunch	$I = 50 \text{ mA}$
Beam Lifetime	$\tau = 200 \text{ min. at } I = 200 \text{ mA}$
Circumference	$C = 53.2 \text{ m}$
Superperiodicity	$N_{\text{superperiodicity}} = 4$
Bending Radius	$\rho = 2.2 \text{ m}$
Betatron Wave numbers	
Horizontal	$Q_x = 3.16$
Vertical	$Q_y = 2.65$
Momentum Compaction Factor	$\alpha = 0.032$
RF Frequency	$f_{\text{RF}} = 90.115 \text{ MHz}$
RF Voltage	$V_{\text{RF}} = 50 \text{ kV}$
Natural Emittance	
Horizontal	$\epsilon_x = 1.15 \times 10^{-7} \pi \text{ m rad}$
Vertical ^{a)}	$\epsilon_y = 1.15 \times 10^{-8} \pi \text{ m rad}$
Beam Sizes	
Horizontal	$\sigma_x = 0.39 \text{ mm}$
Vertical ^{a)}	$\sigma_y = 0.27 \text{ mm}$
Bunch Length	$\sigma_l = 170 \text{ psec}$

a) 10 % coupling is assumed.

Table 2. Beam Lines at UVSOR

Beam Line	Monochromator, Spectrometer	Wavelength Region	Acceptance Angle(mrad)		Experiment
			Horiz.	Vert.	
BL1A	Double Crystal	15 - 8 Å	4	1	Solid
BL1B	1m Seya-Namioka	6500 - 300 Å	60	6	Gas & Solid
BL2A	1m Seya-Namioka	4000 - 300 Å	40	6	Gas
BL2B1	2m Grasshopper	600 - 15 Å	10	1.7	Gas & Solid
BL2B2	1m Seya-Namioka	2000 - 300 Å	20	6	Gas
BL3A1	None (Filter, Mirror)		(U) 0.3	0.3	Gas & Solid
BL3A2	2.2m Constant Deviation Grazing Incidence	1000 - 100 Å	(U) 10	4	Gas & Solid
BL3B	3m Normal Incidence	4000 - 300 Å	20	6	Gas
BL4A	None		6	6	Irradiation
BL4B	None		8.3	6	Irradiation
BL5B	Plane Grating	2000 - 20 Å	10	2.2	Calibration [#]
BL6A1	Martin-Pupplet	5000 - 50 μm	80	60	Solid
BL6A2	Plane Grating	6500 - 80 Å	10	6	Solid
BL6B	FT-IR	2500 - 1 μm	70	25	Solid
BL7A	Double Crystal	15 - 8 Å	2	0.3	Solid
		15 - 2 Å	(W) 1	0.15	Solid
BL7B	1 m Seya-Namioka	6500 - 300 Å	40	8	Gas & Solid
BL8A	None (Filter)		25	8	Irradiation, User's Instrm.
BL8B1	2.2 m Rowland Circle Grazing Incidence	440 - 20 Å	10	2	Gas & Solid
BL8B2	Plane Grating	6500 - 80 Å	10	6	Solid

[#] The BL5B constructed and used by National Institute for Fusion Science, will belong to UVSOR from the fiscal year 1993.

U: with an undulator ($\lambda_u=85\text{mm}$, $N=25$, $\lambda_1=1500-235$ Å), W: with a wiggler (4T).

LOCATION

Ultraviolet Synchrotron Orbital Radiation (UVSOR) Facility, Institute for Molecular Science (IMS) is located at Okazaki. Okazaki (population 300,000) is 260 km southwest of Tokyo, and can be reached by train in about 3 hours from Tokyo via New Tokaido Line (Shinkansen) and Meitetsu Line.



Address

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