

付録 4

表 1. 硬X線実験ステーションの性能表

ステーション名	水平取込角 (mrad)	分光器	ミラー	光のエネルギー範囲 (keV)	ビームサイズ (H×V) (mm)	試料位置での光子数 (photons/s)	エネルギー分解能 ($\Delta E/E$)×10 ⁻⁴	参考文献
BL-1A	0.01	Channel-Cut Si(111) Liquid N ₂ Cooling	Bimorph Si Rh-Coated Si Rh-Coated	3.7 ~ 4.5 11.2 ~ 12.9	0.013×0.013	5×10 ¹⁰ @11.2 keV	~2	1, 2
BL-3A	1	Flat Double Crystal Si(111)	Bent Cylinder	4 ~ 14	0.6×0.4	6×10 ¹²	~5	3, 4
BL-3C	1.75	Double Crystal Si(111)	None	4 ~ 20 or white	20×6 (mono) 0.1×0.1 (white)		~2	
BL-4A	6	Double Crystal Si(111)	KB mirror polycapillary	4 ~ 17	0.005×0.005 0.03×0.03		~2	5, 6
BL-4B2	4.5	Flat Double Crystal Si(111)	Bent Cylinder	6 ~ 20	13×2		~2	7, 8
BL-4C	2	Flat Double Crystal Si(111)	Bent Cylinder	5 ~ 18	0.8×0.6		~5	9, 10
BL-5A	0.125	Double Crystal Si(111) Liquid N ₂ Cooling	Bent Plane Si Rh-Coated Bent Cylinder Si Rh-Coated	6.5 ~ 17	0.8×0.2	1.3×10 ¹¹ (0.2×0.2 mm ²)	~2	
BL-6A	2	Bent Crystal Ge(111) ($\alpha = 8.0^\circ$)	Bent Cylinder ULE	8.3 (fixed)	0.5×0.2	1.0×10 ¹² /mm ² (Slit full-open)	~10	11, 12
BL-6C	2	Flat Double Crystal Si(111)	Bent Cylinder	5 ~ 20 (~25 non-Focus)	0.5×0.3			
BL-7C	4	Double Crystal Si(111) Sagittal Focusing	Double Mirror Fused Quartz Focusing	4 ~ 20 (4 ~ 13)	5×1	1×10 ¹⁰ /6 mm ² (8 keV, 300 mA) (1×10 ¹¹ when focused)	~2	13 - 15
BL-8A	2.22	Flat Double Crystal Si(111)	Bent Cylinder	5 ~ 19	0.82×0.52	3.2×10 ¹¹ (12.4 keV, 400 mA)	~5	16
BL-8B	2.21	Flat Double Crystal Si(111)	Bent Cylinder	5 ~ 19	0.75×0.45	2.2×10 ¹¹ (12.4 keV, 400 mA)	~5	16
BL-9A	3	Double Crystal Si (111)	Collimating and Focusing Bent Conical Mirrors Rh-Coated Double Flat Mirror Ni-Coated	2.1 ~ 15	0.5×0.3	6×10 ¹¹ (7 keV, 450 mA)	2	17, 18
BL-9C	3.5	Double Crystal Si(111)	Bent Cylinder Rh-Coated	4 ~ 20	0.8×0.6	1×10 ¹¹ (8 keV, 450 mA)	~2	
BL-10A	1	Si(111), Si(311) Quartz(100) PG(002) Curved Si(111) ($\alpha \sim 4^\circ, 8^\circ$)	Plane Pt Coated Fused Quartz	5 ~ 25	10×3		10~5	19
BL-10C	2.1	Fix-Exit Double Crystal Si(111)	Bent Cylinder Rh-Coated	6 ~ 14	0.63×0.18	1.5×10 ¹¹ (8 keV)	2	
BL-12C	2	Double Crystal Si(111)	Bent Cylinder Rh-Coated, Double Flat Mirror Ni-Coated	4 ~ 23	0.6×0.6	9×10 ¹⁰ (8 keV, 450 mA)	~2	20

ステーション名	水平取込角 (mrad)	分光器	ミラー	光のエネルギー 範囲 (keV)	ビームサイズ (H×V) (mm)	試料位置での光子数 (photons/s)	エネルギー 分解能 ($\Delta E/E$) $\times 10^{-4}$	参考文献
BL-14A	1.28 (Vertical)	Double Crystal Si (111) Si (311) Si (553)	Bent Cylinder Rh-Coated Fused Quartz	5.1 ~ 19.1 9.9 ~ 35.6 22.7 ~ 84.5	2×1 at focus 5×38		2	21
BL-14B	2.2 (Vertical)	Flat Double Crystal Si(111)	None	10 ~ 57	5×14		2	22
BL-14C	1.96 (Vertical)	Double Crystal Si(111), Si(220)	None	5 ~ 100 or white	6×70		2	23, 24
BL-15A1	0.2	Double Crystal Si(111) Liquid N ₂ Cooling	Horizontal: Bent Plane Si Bimorph Silica Rh-Coated Vertical: Bent Plane Si Rh-Coated Double Flat Si Ni-Coated	2.1 ~ 15	0.02×0.02	3.5×10 ¹¹ (7.5 keV, 450 mA)	~2	25
BL-15A2	0.2	Double Crystal Si(111) Liquid N ₂ Cooling	Horizontal: Bent Plane Si Bimorph Silica Rh-Coated Vertical: Bent Plane Si Rh-Coated Double Flat Si Ni-Coated	2.1 ~ 15	0.6×0.04	3.5×10 ¹¹ (7.5 keV, 450 mA)	~2	25, 26
BL-17A	0.1 ~ 0.2	Double Crystal Si(111) Liquid N ₂ Cooling	Horizontal: Bent Plane Si Rh-Coated Bimorph Silica Rh-Coated Vertical: Bent Plane Si Rh-Coated Bimorph Silica Rh-Coated	6 ~ 13	0.08×0.016	3.1×10 ¹¹ (12.4 keV, 450 mA, 0.04×0.016 mm ²)	~2	27 - 29
BL-18B [India, DST]	2	Double Crystal Si(111)	Plane and Bent Cylinder	6 ~ 20			~2	
BL-18C	1	Double Crystal Si(111)	Cylinder Fused Quartz Pt-Coated	6 ~ 25	0.07×0.04		~2	
BL-20B	2	Double Crystal Si(111)	None	5 ~ 25 or white	26×5	1×10 ¹¹ (12 keV, 450 mA)	~2	
BL-27B	4	Double Crystal Si(111)	None	4 ~ 20	100×6		~2	30
AR-NE1A	0.28	Micro-Channel Double Crystal Si(111), High- Resolution Channel Cut Si(4,2,2)&(12,2,2)	Bent Plane W/C Multilayer Coated Si	6 ~ 50	0.8×0.2	8×10 ¹¹ (0.2×0.2mm ²)	~2	
AR-NE3A	H:0.2 V:0.1	Double Crystal Si(111) Liquid N ₂ Cooling	Pre-Mirror Bent Flat Si Rh-Coated Post-Mirror Bent Cylinder Fused Quartz Rh-Coated	6.5 ~ 17	0.8×0.2	8×10 ¹¹ (0.2×0.2 mm ²)	~2	31, 32

India DST: インド政府科学技術省 (Department of Science & Technology)

ステーション名	水平取込角 (mrad)	分光器	ミラー	光のエネルギー 範囲 (keV)	ビームサイズ (H×V) (mm)	試料位置での光子数 (photons/s)	エネルギー 分解能 ($\Delta E/E$)×10 ⁻⁴	参考文献
AR-NE5C	3	Double Crystal Si(111)	None	30 ~ 100 or white	60×5		5	33
AR-NE7A	4	Double Crystal Si(111)		25 ~ 50 or white	80×3		5	
AR-NW2A	H:1.0 V:0.2	Double Crystal Si(111) Liquid N ₂ Cooling	Bent Cylinder Si Rh-Coated Bent Flat Si Rh-Coated	5 ~ 25	0.6×0.2 ~10×0.06	6×10 ¹² (12 keV, 60 mA)	~2	34 - 36
AR-NW10A	1.2	Si(311)	Bent Cylinder Pt-Coated, Double Flat Mirror Rh-Coated	8 ~ 42	2.2×0.5	1×10 ¹⁰ (22 keV, 60 mA)	~1	37
AR-NW12A	H:0.3 V:0.1	Double Crystal Si(111) Liquid N ₂ Cooling	Pre-Mirror Bent Flat Si Rh-Coated Post-Mirror Bent Cylinder Si Rh-Coated	6.5 ~ 17	1.3×0.3	2×10 ¹¹ (0.2×0.2 mm ²)	~2	38 - 40
AR-NW14A	H:0.3 V:0.1	Double Crystal Si(111) Liquid N ₂ Cooling	Bent Cylinder Rh-Coated Bent Flat Rh-Coated	4.9 ~ 25	0.45×0.25	1×10 ¹²	~2	41

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表 2. 真空紫外・軟X線実験ステーションの性能表

ステーション名	スリットサイズ H×V (mrad) または アンジュレータの パラメータ	分光器	溝密度 (/mm)	光のエネルギー 範囲 (eV)	ビームサイズ H×V (mm)	エネルギー分解能 (E/ΔE) 光子数 (photons/s)	参考文献
BL-2A ID02-1: Planer Undulator ID02-2: Variable Polarized Undulator	ID02-1: $K_{\max} = 2.3$, $\lambda_u = 6$ cm ID02-2: $K_{\max} = 4.93$, $\lambda_u = 16$ cm	Variable-Included-Angle Varied-Line-Spacing Plane Grating	400 600 1000	30 ~ 2000	~0.5 × 0.1	2000 ~ 20000 $10^{13} \sim 10^{11}$	1
BL-2B ID02-1: Planer Undulator ID02-2: Variable Polarized Undulator	ID02-1: $K_{\max} = 2.3$, $\lambda_u = 6$ cm ID02-2: $K_{\max} = 4.93$, $\lambda_u = 16$ cm	Variable-Included-Angle Varied-Line-Spacing Plane Grating Double Crystal InSb(111), Ge(111), Si(111)	400 600 1000	30 ~ 4000	~0.5 × 0.1	2000 ~ 20000 $10^{13} \sim 10^{11}$	1
BL-3B	10×2	Grazing Incidence R = 24 m $\alpha+\beta = 165^\circ$ 1800	200 600	10 ~ 280	< 2φ	200 ~ 3000 $10^{12} \sim 10^9$	2, 3
BL-7A [RCS]	6×1	Varied-Line-Spacing Plane Grating	150 300 650	50 ~ 1300	2.5×0.5	1000 ~ 9000 $10^{12} \sim 10^9$	4
BL-11A	5×1	Varied-Included-Angle Varied-Line-Spacing Plane Grating	600 1200	70 ~ 1900	2×1	500 ~ 5000 $10^{12} \sim 10^9$	
BL-11B	4×0.6	Double Crystal InSb (111), Si (111)		1724 ~ 5000	5×2	2000 10^{10}	5-7
BL-11D	4×2	Grazing Incidence Varied Deviation-Angle On-Blaze Mount $R_1 = 52.5$ m $R_3 = 22.5$ m	2400	60 ~ 245 200 ~ 900	1×0.1	2000 10^{11}	8, 9
BL-13A/B Variable Polarized Undulator	$K_{\max} = 5.28$ (Horizontal Linear Polarization) $K_{\max} = 3.65$ (Vertical Linear Polarization) $\lambda_u = 7.6$ cm	Variable-Included-Angle Varied-Line-Spacing Plane Grating	300 1000	50 ~ 330 100 ~ 2000	~0.22×0.05	4000 ~ 12000 $10^{13} \sim 10^9$	10-12
BL-16A ID16-1 & ID16-2: Variable Polarized Undulator	$K_{\max} = 2.37$ (Circular Polarization) $K_{\max} = 3.12$ (Horizontal Linear Polarization) $K_{\max} = 1.98$ (Vertical Linear Polarization) $K_{\max} = 1.73$ (45-deg Linear Polarization) $\lambda_u = 5.6$ cm	Variable-Included-Angle Varied-Line-Spacing Plane Grating	100, 250, 500, 1000	250 ~ 1500	~0.2 × 0.1	4000 ~ 8000 $10^{12} \sim 10^{11}$	13, 14
BL-19A/B Variable Polarized Undulator	$K_{\max} = 4.50$ (Horizontal Linear Polarization) $K_{\max} = 2.87$ (Vertical Linear Polarization) $K_{\max} = 2.42$ (Circular Polarization) $\lambda_u = 6.8$ cm	Variable-Included-Angle Varied-Line-Spacing Plane Grating	600 1200	90 ~ 2000	0.2×0.05(19B)	>5000 10^{13}	1
BL-20A	28 × 5	3 m Normal Incidence	1200 2400	5 ~ 40	2×1	300~30000 $10^{12} \sim 10^8$	15
BL-27A	5 × 0.5	Double Crystal InSb (111)		1800~ 4000		2000	16

RCS: 東京大学大学院理学系研究科附属スペクトル化学研究センター (Research Center for Spectrochemistry)

ステーション名	スリットサイズ H×V (mrad) または アンジュレータの パラメータ	分光器	溝密度 (/mm)	光のエネルギー 範囲 (eV)	ビームサイズ H×V (mm)	エネルギー分解能 (E/ΔE) 光子数 (photons/s)	参考文献
BL-28A/B Variable Polarized Undulator	$K_{\max} = 4.93$ (Horizontal Linear Polarization) $K_{\max} = 4.93$ (Vertical Linear Polarization) $\lambda_u = 16.0$ cm	Variable-Included-Angle Varied-Line-Spacing Plane Grating	400	30 ~ 300	0.15×0.05	30000 10^{12}	1

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表 3. 低速陽電子実験ステーションの性能表

ステーション名	ビームエネルギー	パルス幅	繰り返し周波数	ビーム強度	参考文献
SPF-A3	100 eV - 35 keV	1.2 μ s	≤ 50 Hz	5×10^7 e ⁺ /s (before brightness enhancement)	1, 2, 3
SPF-A4	50 eV - 1 keV	1.2 μ s (long-pulse mode), 200 μ s - 20 ms (pulse- stretching mode, ≤ 5.2 keV)	≤ 50 Hz	5×10^7 e ⁺ /s (before brightness enhancement)	
SPF-B1	100 eV - 35 keV	1-10 ns	≤ 50 Hz	5×10^6 e ⁺ /s	4, 5
SPF-B2	100 eV - 35 keV	1-10 ns	≤ 50 Hz	5×10^6 e ⁺ /s	6, 7

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