Author index

Author Index

A

Apih T. P08-01

Abe E. P02-12, P02-13, **S10-03**

Abe H. **P02-08**, **P02-09**

Addou R. S07-03

Akiyama S. S08-02

Al Ajlouni R, **P03-09**

Alarcón Villaseca S. P05-09, **P05-10**

Ali F. P01-03

B

Baake M.P03-06, **S09-03**

Basu B. P06-08

Bechinger C. P07-01, **S03-02**

Belin-Ferré E. S05-03

Belov M.P. **P04-17**

Ben-Abraham S.I. **P03-07**

Berger R. S14-01

Biswas K. **P06-08**, **S12-04**

Bogdanowicz W. P01-01

Bohlein T. S03-02

Bonina D. S12-03

Bothner D. S11-03

Bugarin E.P. P03-04

C

Canfield P.C. S01-01

Caudle M.L. S01-01

Chen E.R. S02-01

Chen H. **P01-14**

Chen J.X. P02-01

Chernikov M.A. P01-04, P04-16, **S05-02**

Choi S.-B. **P06-03**

Cross N. P05-07

Cui C. **P01-08**, P05-04, P05-05, P05-06, S01-02, S07-01

D

Dasai S. **P01-06**

De Las Peñas M.L.A.N. **S09-01**, P03-03

de Boissieu M. P02-19, **S01-02**, S06-04

de Weerd M.-C. P05-08, P05-09, P05-10, S07-03

Deloudi S. P02-17

Dennis K.W. S01-01

Dhanak V.R. P05-05, P05-07, S07-01

Diakonov D.L. P01-02

Diehl R. P05-09

Dolinšek J. P04-12, P08-01, **S13-02**

Dong C. P01-13, P01-14, **P02-01**

Dotera T. **S03-01**

Dshemuchadse J. **P08-08**

Dubois J.-M. P05-03, P05-08, P05-09, P05-10, **S05-03**, S07-03, S12-03

Duda M. **P08-03**

Duguet T. P05-03, P05-08

E

Eckert J. P01-03

Edagawa K. P02-11, P04-04, **P04-05**

Engel M. **S02-01**

Euchner H. P02-19, S01-02, **S06-04**

Evans J.W. P05-03

F

Falkovskiy F.I. P01-02

Fan C. **P02-17**

Feuerbacher M. S13-02

Fleury E. S12-05

Formanek B. P01-01

Fournée V. P05-03, **P05-08**, P05-09, P05-10, S07-03, S12-03,

Frettlöh D. P03-04

Fujita N. S02-02, **S09-02**

G

Gähler F. **S08-01**

Gaudry É. P05-08, **P05-09,** P05-10

Gera G. P07-01

Gille P. P04-12, P05-10, S07-03

Glotzer S.C. S02-01

Goldman A.I. **S01-01**

Gómez C.P. P02-07, **P02-18**, P02-19, P05-04, S01-02, S06-04

Goto H. S13-01

Gozo, Jr. B.R. P03-03

Grimm U. **P03-06,** P07-03

Grin Y. P05-09

Gröning O. S07-03, S11-01

H

Hafner J. S04-02, S07-04

Haji-Akbari A. S02-01

Han Y. P05-03

Heggen M. S13-02

Henley C.L. P02-02, **P02-03**, P02-04, S04-02

Helden L. S03-02

Hernandez J.C. P04-19

Hiraga K. P02-16

Hirao A. P02-22

Hiroto T. **P04-15**, S06-02

Ho C.-S. S01-01

Hoffmann R. S14-01

Hong S.M. S12-05

Honma T. P02-22

Hyodo H. S14-03

I

Ibuka S. **P04-08**

Iga H. **P01-12**

Iida K. P04-08

Inoue A. P01-13

Inukai M. P02-11, **P08-07**

Isaev E.I. P04-17

Ishibashi Y. **P02-23**

Ishii Y. P05-04, P05-11, S07-01

Ishimasa T. P01-12, **P02-22**

Ishizaki K. P01-05

Ivkov J. P04-12

J

Jagannathan A. **S06-01**

Jagličić Z. S13-02

Jagodič M. S13-02

Jenks C.J. P05-03

Jing D. S07-02

Johnson M.R. S06-04

Jung D.Y. **P04-22**, P08-08

K

Kaji N. P02-16

Kajiwara K. **P06-06**

Kaloshkin S.D. P01-02

Kameoka S. P06-05, P08-11, S12-04

Kanazawa I. P04-01, P04-02, **P04-11**

Kaputkina N.E. **P04-20**

Kashimoto S. **P04-07**

Kashiwagi Y. P08-11

Kato A. P06-07

Kato K[1]. **P02-06**

Kato K[2]. S14-03

Kato M. P02-11

Kawabe Y. P06-04

Kawana D. P04-03, S06-03

Kemmler M. S11-03

Kenzari S. **S12-03**

Kim J.Y. P06-03

Kim M.G. S01-01

Kimura K. P02-13, P04-01, P04-02, **S14-03**

Kitahata H. P04-01

Kirihara K. S14-03

Kleiner R. S11-03

Kobe S. P06-01

Kocjan A. **P06-01** ,P08-01

Koelle D. S11-03

Kondo Y. P02-12

Korotaev P.Yu. P04-20

Kovač J. P06-01

Kovačič S. P06-01

Kothalkar A.D. P06-08

Koshiya S. **P04-09**

Kösters H. S09-03

Kracher A. S01-01

Krajčí M. S04-02, **S07-04**

Krawczyk J. P01-01

Kreyssig A. S01-01

Kuczera P. **S10-01,** P03-08

L

Laigo G.R. **P03-03**

Ledieu J. P05-03, P05-08, P05-09, P05-10, **S07-03**

Lee S. **S14-01**

Lee S.-H. P06-03

Lee J.-Y. **S08-02**

Liao L. S09-01

Lidin S. S06-04

Lifshitz R. **S05-04**

Lin X. S01-01

Liu W. **P06-04**

Liu Y. P08-04, P08-06

Liu Z.Y. P02-14

Lograsso T.A. P05-07

Loquias M. S08-03

Lozovik Yu.E. P04-20

Lu L. P01-09, P08-10

Lück R. **P03-01**, **P03-02**

M

Machida A. P04-03, S06-03

Mäder R. S11-01

Mandal R.K. P04-06

Mandel S.E.-D. S05-04

Matsui T. P05-01, P05-02

Matsui Y. P06-06

Matsushita Y. **S15-02**
Matsushita Y. P04-01
Mayou D. S11-02
McCallum R.W. S01-01
McGrath R. P05-04, P05-06, P05-07, S07-01
McGuiness P.J. P06-01, P08-01
McLeod I.M. **P05-05**
Mihalkovič M. P01-12, **P02-02**, P02-03, P02-04, P02-22, **S04-02**, S06-04
Mikami M. S13-01
Mikhael J. **P07-01**, S03-02
Misko V.R. **S11-03**
Miyasaka K. S02-02
Miyazaki Y. **P02-13**
Mizutani U. P08-07, **S01-04**
Mori T. P04-13, P04-14
Mukai T. P08-02, P08-05, S12-01
Mukhopadhyay N. K. **P01-03**, P06-06
Muraki M. P02-20, P02-21
Murao R. **P08-11**
Muro Y. S06-02
Muto T. P08-09

N

Nakahara H. **P02-10**
Nandi S. S01-01
Nicula R. P01-05
Nie X. P08-04, P08-06
Nigmatulin A.S. P01-04
Nishimoto K. **P02-20**, P02-21
Nishio K. P04-13, P04-14
Nori F. S11-03
Nozawa K. **P05-11**
Nugent P.J. P05-04, P05-05, **P05-06**, S07-01

O

Oguey C. S11-02
Ohdaira T. P04-01
Ohhashi S. P04-09, P05-04, S06-04, **P06-07**
Okada J.T. P02-13
Orsni-Rosenberg H. **S04-03**
Osawa Y. S12-01
Oshima N. P04-01
Örs T. **P01-11**

P

Peeters F.M. S11-03
Pennycook S.J. S10-03
Ponosov Yu.S. P04-10
Popčević P. P04-12
Prekul A.F. P04-05
Pussi K. P05-09

Q

Qiang J.B. **P01-13**, P01-14, P02-01
Quandt A. P03-07

R

Rosalie J.M. P08-02, **P08-05**
Ross A.R. P05-07
Rösch F. **S11-04**
Ruffieux P. S11-01

S

Sagisaka K. P05-04

Saito M. P04-01

Saitoh K. P02-10, P02-23

Sakaliyska M. P01-03

Sakamoto Y. S02-02

Sanchez V. **P04-18**

Sato H. P08-07 , S01-04

Sato M. P05-01

Sato S. P04-04

Sato T. P02-20, **P02-21**

Sato T.J. P04-08

Sawada H. P02-12

Schober H. S06-04

Schreiber M. P07-03

Scudino S. P01-03

Seki T. **P02-12**, S10-03

Shahi R.R. P01-07

Sharma H.R. P05-04, P05-05, P05-06, P05-07, P05-08, **S07-01**

Shaz M.A. P01-07

Shchegolikhina N.I. P04-05

Shen Y. P08-04, P08-06

Shen Z. P01-05

Shevchukov A.P. **P01-02**

Shimoda M. **P05-04,** P05-06, S07-01

Shin H. P05-09

Shukla A.K. P05-08, S07-03

Shulyatev D.A. **P01-04**

Simura R. P02-15, **P02-16**

Simutis G. S07-01

Singh A. **P08-02**, P08-05, **S12-01**

Singh D. P01-07, **P04-06**

Smerdon J.A. P05-04, P05-05, P05-06, P05-07, S07-01

Smontara A. **S05-01**, **P04-12**

So Y.G. P02-11, **P04-04**

Soda K. **P02-11**, P08-07

Soga K. S14-03

Somekawa H. P08-02, P08-05, S12-01

Sozańska M. P01-01

Srivastava O.N. P01-07, P04-06, P06-06

Srivastava V.C. P01-03

Steinhardt P.J. **S15-01**

Steurer W. P01-11, P02-17, P04-22, P08-08, **S01-03**, S04-03, S10-01, S10-02

Stir M. P01-05

Strutz A. **S10-02**

Strzałka R. P03-08

Sugiura H. P02-23

Sugiyama K. P02-15, P02-16, **P08-09**, P08-11

Sun W. **P02-14**

Sun Y.F. P08-10

Surowiec M. **P01-01**

Surreddi K.B. P01-03

Suzuki H. **P04-01**, P04-11

Suzuki R. P04-01

Suzuki S. **P02-15**

Sviridova T.A. P01-02

T

Takabatake T. S06-02

Takagiwa Y. P04-01, **P04-02** , S14-03

Takakura H. P01-06, P02-18, P05-04, **S04-01**
Takata M. S14-03
Takayanagi K. P02-12
Takeuchi T. **S13-01**
Tamura R. P02-19, P02-20, P02-21, P04-04, P04-13, P04-14, P04-15, **S06-02**
Tanabe T. **P06-05**
Tanaka N. P02-10, P02-23
Tcherdyntsev V.V. P01-02
Terasaki O. **S02-02**
Terauchi M. P04-09
Thiel P.A. **P05-03**, P05-08, **S07-02**
Thiem S. **P07-03**
Tiwari R.S. P01-07, P04-06
Tokiwa K. P04-13
Trambly de Laissardière G. **S11-02**
Trebin H. S11-04
Tripathy G. P06-08
Tsai A.P. P01-08, P02-18, P04-03, P04-09, P05-01, P05-02, P05-04, P05-05, P05-06, P06-05, P06-07, P08-11, S01-02, S06-03, S06-04, S07-01, S12-04,

U

Uhlenwinkel V. P01-03
Ünal B. P05-03, P05-08, S07-02

V

van Smaalen S. **S14-02**
Vani V.K. **S12-05**
Vaucher S. P01-05
Vedmedenko E.Y. S06-01
Vekilov Yu.Kh. **P04-16**, P04-17, P04-20, S05-02

W

Wakuda Y. P04-13, **P04-14**
Wang C. P04-18, **P04-19**
Wang J.B. **P01-09**, P08-04, P08-06, **P08-10**
Wang J.P. P02-14
Wang L. P06-04, **S12-02**
Wang Q. P01-13, P01-14, P02-01
Wang X. P06-04, S12-02
Wang Y.M. P01-13, P01-14, P02-01
Watanuki T. **P04-03**, **S06-03**
Weber T. P02-17
Widmer R. S07-03, **S11-01**
Widom M. P02-02
Wolny J. **P03-08**, P08-03, S10-01

X

Xiao C. S02-02
Xiong D.G. P08-10
Xu Y. S12-04

Y

Yadav T.P. **P01-07**, P04-06, P06-06
Yagi S. P02-11
Yaguchi H. S06-02
Yamada K. P04-11
Yamada T. **P02-19**, S01-02
Yamamoto A. P02-06, **P02-07**, P02-18, P02-19, **S04-04**, S10-02

Yokoyama Y. P02-13, P08-01, P08-09

Yoshida T. P02-13

Young K.M. **P05-07**

Yuen C. S07-02

Yuhara J. **P05-01**, P05-02

Z

Zeiner P. **S08-03**

Zenkyu R. **P05-02**

Zhang W. P01-13

Zhang X. **S13-03**

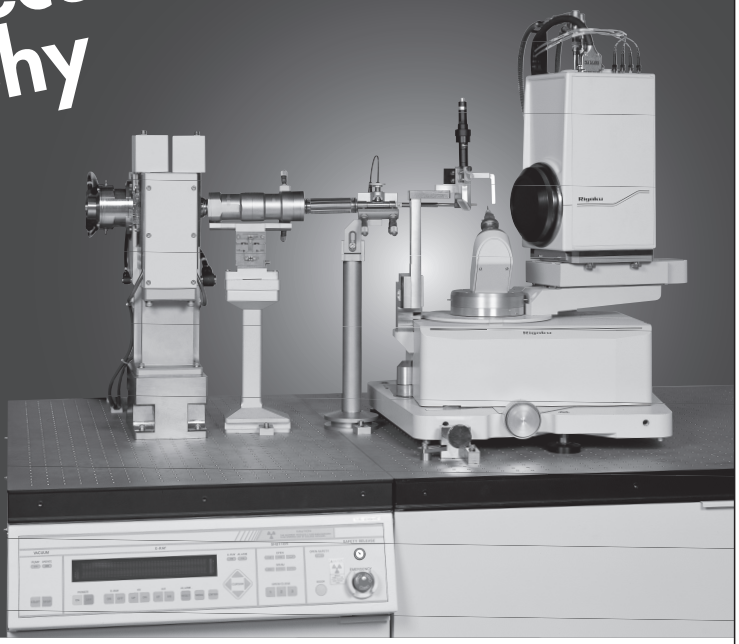
Zhang Z. S12-02

Zhao D.S. P01-09, **P08-04, P08-06,** P08-10

Zhou J.P. P08-04, P08-06

Zhu S.J. P08-04, P08-06

VariMax Mo for Small Molecule Crystallography

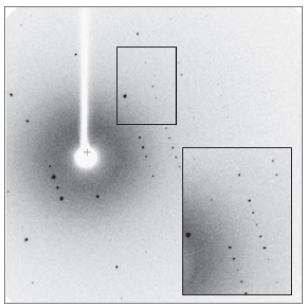


Single crystal X-ray CCD system for very small crystals.

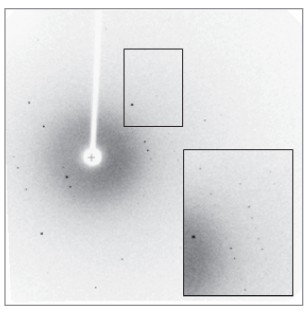
The X-ray source of this single crystal structure analysis system consists of a microfocus X-ray generator, the RA-Micro7, and a newly developed CMF optics designed specifically for molybdenum radiation, the VariMax Mo. This configuration improves the usable flux for small samples* by nearly a factor of 10 over a conventional system. The VariMax Mo also allows the user to vary the divergence as needed to resolve large unit cells or improve the signal-to-noise ratio.

* As compared to an ultraX-18 configured with a graphite monochromator.

Measurement example



RA-Micro7 and VariMax Mo at 50 kV, 16 mA
Weak reflections from a very small sample are clearly observed.



ultraX-18 and graphite monochromator at 60 kV, 90 mA
Weak reflections from the same crystal are not visible.

【Measurement condition】
Sample : Cytidine
Crystal : 0.02×0.02×0.02 mm
Camera length : 45 mm
Detector : Saturn70 CCD
Wavelength : Mo Kα

Almost 10 times higher flux than conventional graphite optics.

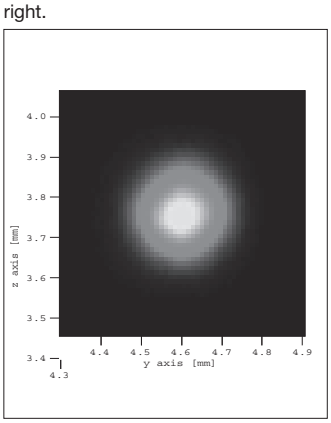
The usable flux produced by the RA-Micro7 and VariMax Mo source combination is almost 10 times greater than a conventioanl rotating anode and graphite monochromator.

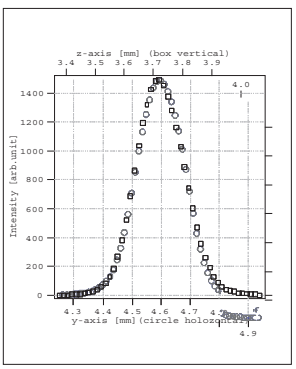
X-ray generator	Optic	Relative intensity ratio	
		0.3 mm dia. pinhole	0.1 mm dia. pinhole
RA-Micro7	VariMax Mo	3.2	9.5
ultraX-18	Graphite monochromator	1	
Sealed tube		0.25	

* The intensities were measured with the pinhole installed at the sample position.

Virtually ideal circular beam

The VariMax Mo optic, using advanced Osmic, Inc. technology, provides a nearly circular beam at the focal spot. This high-brilliance beam can be used on samples smaller than 0.3 mm. However, the real benefit of this high brilliance beam is observed with very small samples as shown on the right.

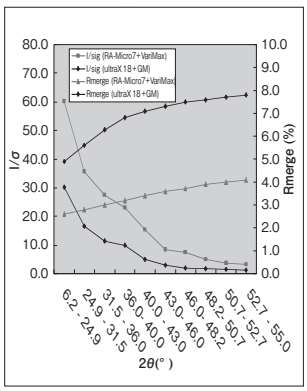




Horizontal: FWHM =0.193 mm
FW10M=0.334 mm
Vertical: FWHM =0.194 mm
FW10M=0.346 mm

Highest performance is clearly shown for very small crystals.

Comparison using 0.02 mm cytidine crystal



The RA-Micro7 and VariMax Mo can be refitted to an existing Mercury or Saturn CCD system. Contact Rigaku for more details.

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