

RSM Measurement : asymmetric Part

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1. How to set Part conditions

In this chapter, how to set the **RSM Measurement : asymmetric** Part conditions is described.

1.1 Setting conditions

Set the basic conditions in the **RSM Measurement : asymmetric** dialog box.

RSM Measurement : asymmetric

Save measurement data

File name: C:\Documents and Settings\Administrator\My Documents\RigakuTest.ras

Sample name:

Memo:

Detector setting: Type: Scintillation counter

Measurement mode:

- Omega step / 2-theta/omega scan (Standard)
- 2-theta/omega step / Omega scan
- Omega step / 2-theta scan

Analyzer setting:

- Use analyzer after alignment
- Use analyzer without alignment
- Do not use analyzer

Measurement conditions:

Step axis	Range	Start (deg)	Stop (deg)	Step (deg)
Omega	Relative	0.0000	0.0000	0.0010

Scan axis	Mode	Range	Start (deg)	Stop (deg)	Step (deg)	Speed (deg/min)	Attenuator
2-Theta/Omega	Continuous	Absolute	0.0000	0.0000	0.0012	0.0010	Current

Calculated scan duration: 00:00:00

Buttons: Execute, Import..., Export..., OK, Cancel

Fig. 1.1.1 RSM Measurement : asymmetric dialog box

1. How to set Part conditions

File name

Enter the name of the file to save the measurement data in.

Sample name

Enter the sample name (optional). The sample name entered here will be saved in the measurement data file.

Memo

Enter the memo (optional). The memo entered here will be saved in the measurement data file.

Detector setting

Select the detector to be used for the reciprocal space map measurement from **Scintillation counter** or **D/teX Ultra**.

Measurement mode

Select the measurement mode of reciprocal space mapping from **Omega step / 2-theta/omega scan**, or **2-theta/omega step / Omega scan**. And select the scan speed from **Standard** or **Fast**. The value for **Speed (deg/min)** in the **Measurement conditions** section will be set based on the selected mode as shown in the table below.

Mode	Speed (deg/min)
Standard	Sets the standard speed based on the scan range and step width.
Fast	Sets the fastest speed based on the step width.



CAUTION: The 2-bounce analyzer cannot be used if **Fast** is selected.

Analyzer setting

Select whether or not the 2-bounce analyzer is used. Select from **Use analyzer after alignment**, **Use analyzer without alignment**, or **Do not use analyzer**.



CAUTION: The 2-bounce analyzer is an option.

Set RSM origin

Check the **Set RSM origin** box to drive each axis to the position entered here before the RSM (reciprocal space mapping) measurement.

2-Theta

Enter the position to drive the 2-theta axis to in deg.

Omega

Enter the position to drive the omega axis to in deg.

Chi

Enter the position to drive the chi axis to in deg.

Phi

Enter the position to drive the phi axis to in deg.

Read current positions

Sets the current position of each axis in each box.

Run sample orientation alignment

Refines the peak position of the asymmetric plane before the analyzer is installed when instructed. (If **Do not use analyzer** is selected in the **Analyzer setting** section, the peak refinement will be performed before the RSM measurement.)

Step axis	Range	Start (deg)	Stop (deg)	Step (deg)
Omega	Relative	-1.0000	1.0000	0.0100

Range

Select the measurement range specification method from **Absolute** or **Relative**.


Start (deg)

When **Absolute** is selected as the measurement range specification method, enter the absolute start angle of the step axis. When **Relative** is selected, enter the relative distance of the start angle from the RSM origin.

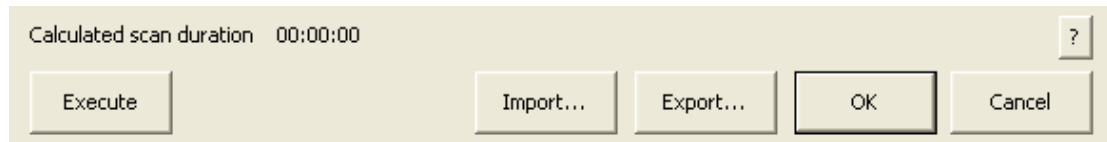
- Stop (deg)** When **Absolute** is selected as the measurement range specification method, enter the absolute stop angle of the step axis. When **Relative** is selected, enter the relative distance of the stop angle from the RSM origin.
- Step (deg)** Enter the step width of the step axis.

Scan axis	Mode	Range	Start (deg)	Stop (deg)	Step (deg)	Speed (deg/min)	Attenuator
2-Theta/Omega	Continuous ▾	Relative ▾	-1.0000	1.0000	0.0100	1.0000	Current ▾

- Mode** Select the scan mode from **Continuous** or **Step**.
- Range** Select the scan range specification method from **Absolute** or **Relative**.
- Start (deg)** When **Absolute** is selected as the scan range specification method, enter the absolute start angle of the step axis. When **Relative** is selected, enter the relative distance of the start angle from the RSM origin.
- Stop (deg)** When **Absolute** is selected as the scan range specification method, enter the absolute stop angle of the step axis. When **Relative** is selected, enter the relative distance of the stop angle from the RSM origin.
- Step (deg)** Enter the step width of the scan.
- Speed (deg/min) / Duration time (sec)** When **Continuous** is selected as the scan mode, enter the scan speed. When **Step** is selected as the scan mode, enter the duration time per measurement point.
- Attenuator** Select the attenuator to be used for the measurement from **Open**, **1/70**, **1/1000**, **1/10000**, **Auto**, or **Current**.

 **Tip:** If **Auto** is selected, an automatic attenuator scan is performed while the attenuator is automatically switched based on intensity.

If **Current** is selected, the attenuator set before this Part is executed will be used.

**Calculated scan duration**

Shows the calculated duration of the RSM measurement.

Execute


Executes the RSM measurement under the conditions specified in the **RSM Measurement : asymmetric** dialog box.



CAUTION: Clicking the **Cancel** button after executing the RSM measurement does not cancel the specified conditions.



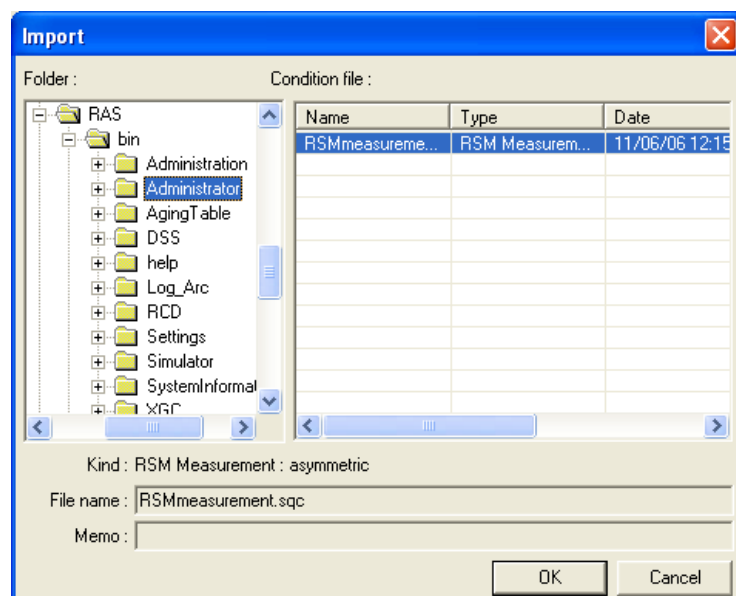
Tip: The RSM measurement is executed with the **RSM Measurement : asymmetric** dialog box open. While the RSM measurement is running, the Part conditions cannot be changed. They can be changed again after the measurement has been completed.

The setting of  (Show confirmation messages) on the flow bar becomes invalid.

Import

Loads the saved Part conditions.

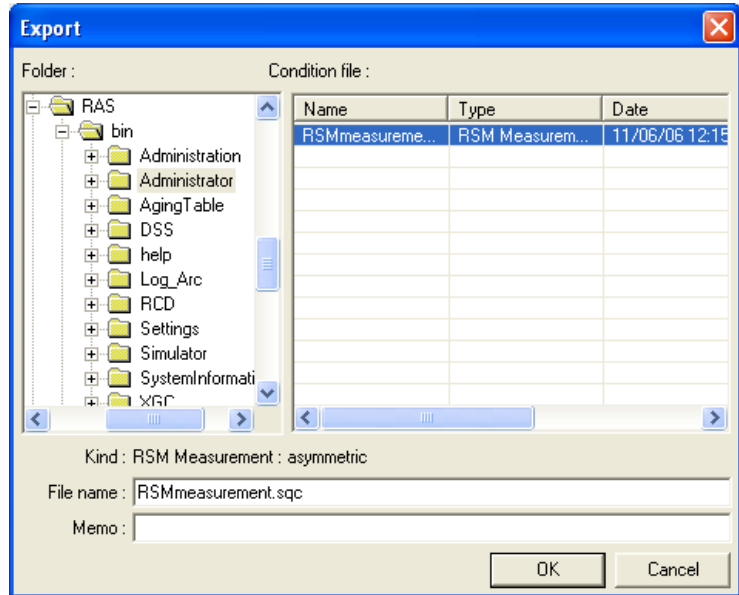
Clicking the **Import** button opens the **Import** dialog box. Select the folder including the file you want to import from the **Folder** tree view. In the **Condition file** list, select the condition file you want to import and click the **OK** button to load the Part conditions.



Export

Saves the specified Part conditions in a file.

Clicking the **Export** button opens the **Export** dialog box. From the **Folder** tree view, select a destination folder to save the conditions file then enter a file name in the **File name** box. Enter comments in the **Memo** box, if needed. After entering them, click the **OK** button.



OK

Sets the conditions and closes the dialog box.



CAUTION: When selecting another Package measurement or switching the task to the **Manual Control** task, etc. the specified conditions will be cancelled. To save the specified conditions in a file, click the **Export** button and save the conditions.

Cancel

Does not set the conditions and closes the dialog box.

?

Opens the online help of this Part.

2. Measurement sequence

The RSM measurement is performed automatically. However, the parallel slit, 2-bounce analyzer, etc. must be installed (or removed) manually as instructed by messages displayed on the screen.

In principle, this Part makes the measurements under the assumption that the axis alignment of the symmetric plane has been completed.

Described below is the measurement sequence when **Omega step / 2-theta/omega scan** and **Standard** are selected for **Measurement mode**, **Use analyzer after alignment** is selected for **Analyzer setting**, and the **Run sample orientation alignment** box is checked.

- (1) The message appears to confirm whether or not the axis alignment of the symmetric plane has been completed. If the axis alignment is not done, the message will appear to confirm whether or not you are going to continue the RSM measurement.
- (2) Before the RSM measurement, perform the peak search of the asymmetric plane based on the entered origin (or the positions of the four axes just before the alignment if the **Set RSM origin** box is unchecked). If the 2-bounce analyzer is installed, remove the analyzer once, then perform the peak search in the receiving optics with lower resolution.

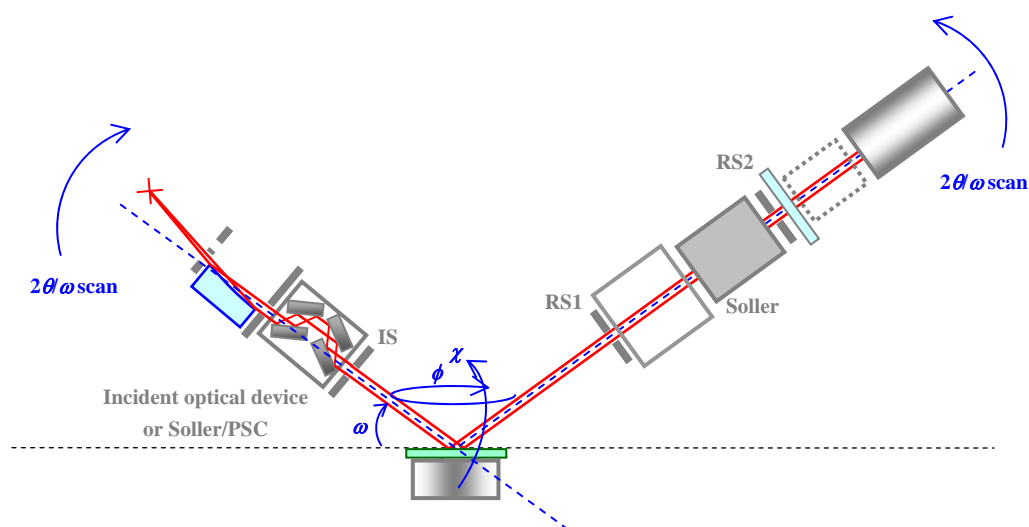


Fig. 2.1 Axis alignment

- (3) Align the analyzer crystal using the direct x-ray beam.
Drive the θ_s and θ_d axes to 0.0° . Remove the receiving optical device adaptor and install the 2-bounce analyzer as instructed by the message.
- (4) Set the RS2 width to 10 mm, and drive the Zd axis to -5.5 mm.

2. Measurement sequence

- (5) Drive the Z axis to -4.0 mm.

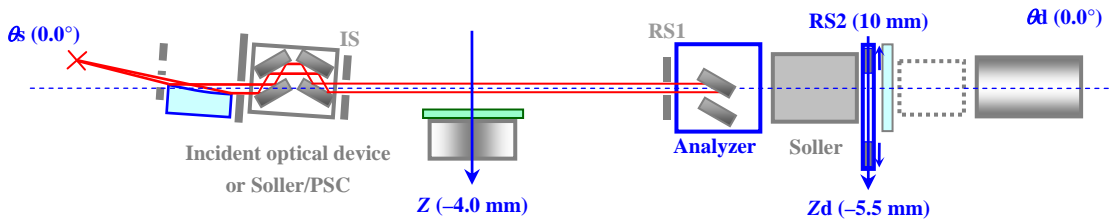


Fig. 2.2 Installation of 2-bounce analyzer

CAUTION: The 2-bounce analyzer is an option.

- (6) Scan the omega_a axis, then drive the omega_a axis to the peak position.

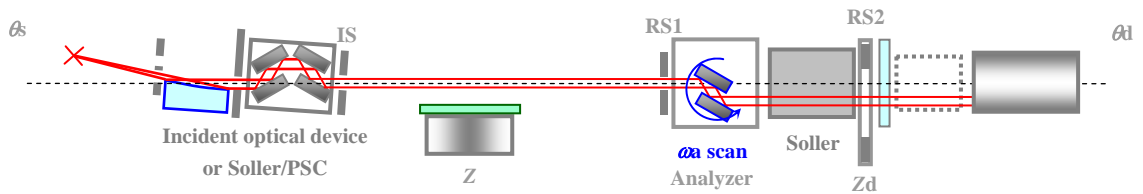


Fig. 2.3 Alignment by omega_a scan

- (7) Set the RS2 width to 1 mm.
Scan the Zd axis, and drive the Zd axis to the peak position.

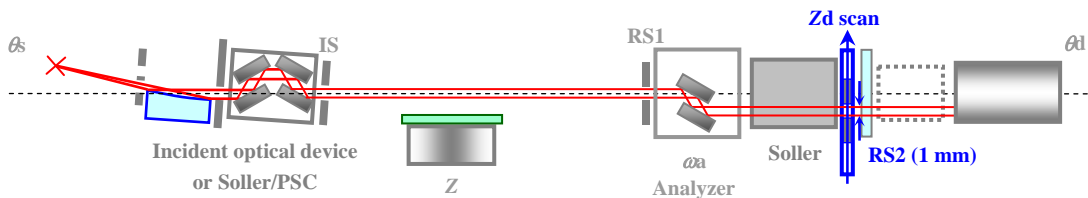


Fig. 2.4 Alignment by Zd scan

- (6) Drive the Z axis to the position adjusted by sample alignment, and the 2-theta, omega, chi, and phi axes to the positions of the substrate reflection adjusted in step (2).

- (7) Perform the axis alignment based on the positions of the substrate reflection using the 2-bounce analyzer. The refined peak position will be set as the measurement origin.

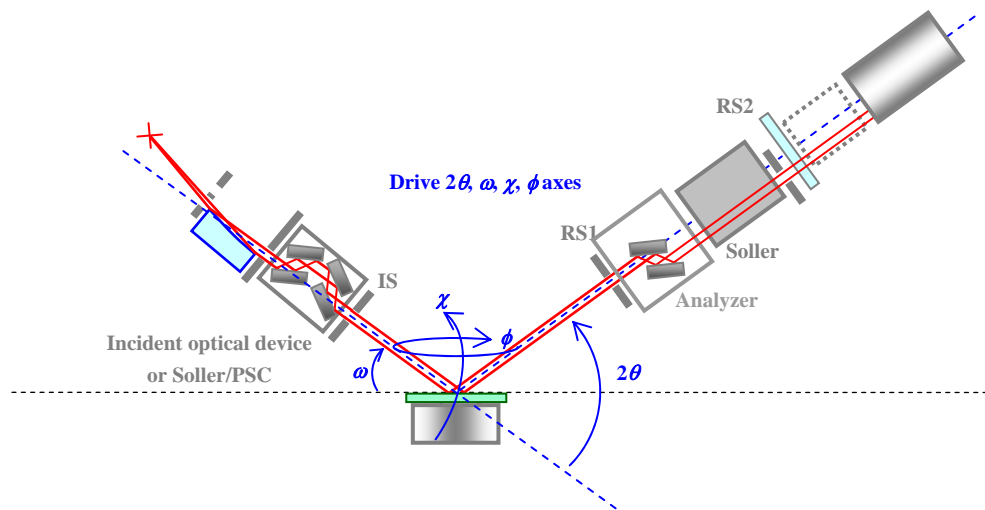


Fig. 2.5 Driving the axes to the substrate reflection positions and axis alignment

- (8) Make the RSM measurement (omega step, 2-theta/omega scan).

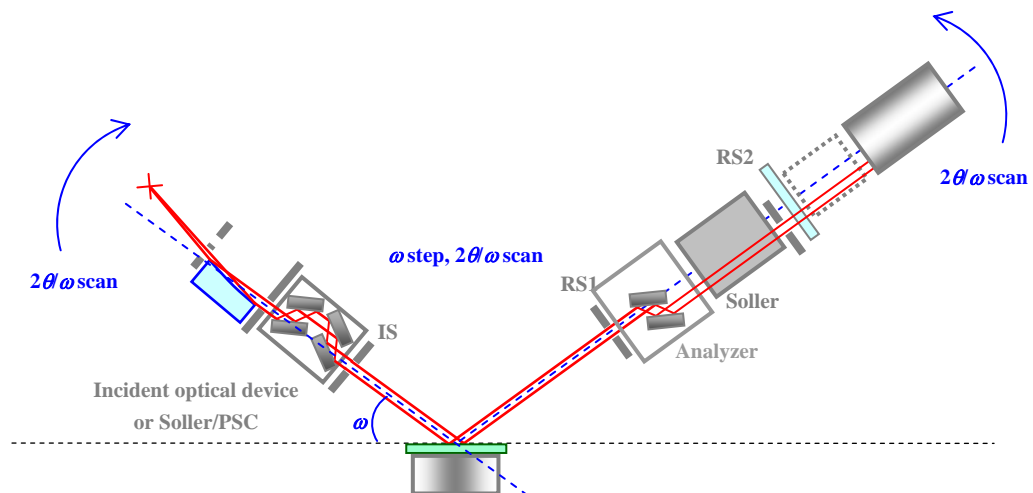


Fig. 2.6 RSM measurement