IBA Plane Viewer Tool
Instructions for Use

DOSIMETRY

IBA Plane Viewer Tool Instructions for Use

SW Version: 1.1

Notice

This user documet is an integral part of the IBA Plane Viewer Tool and should always be kept at hand. If the User's Guide is missing, immediately contact the IBA Dosimetry GmbH for a copy.

Observance of this documet instructions is required for proper performance and correct operation of the IBA Plane Viewer Tool. The IBA Plane Viewer Tool must not be used for any other purpose than what is described in the accompanying documentation (intended use). Violation will result in loss of warranty.

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1. General Description

1.1. Introduction

IBA Plane Viewer Tool is a stand-alone SW for visualizing the reconstructed slice in the RT dose cube at the rotated and/or shifted position of the measurement plane. This tool is an aid that myQA SRS users can use to view and determine the optimal calculated dose plane for the in-phantom rotation measurements using the myQA SRS detector.

IBA Plane Viewer Tool is not a medical device and independent of the myQA Application. It does not require license and can be provided by IBA Dosimetry upon request. To start the tool, double-click the received *PlaneViewerTool.exe* file.
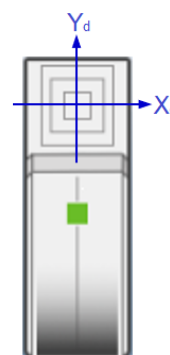
1.2. Coordinate Systems

Two coordinate systems are used in IBA Dose Plane Tool:

- DICOM coordinate system (X, Y, Z) for the RTDose plane display
- myQA SRS detector coordinate system (Xd, Yd) for the resulting dose plane display
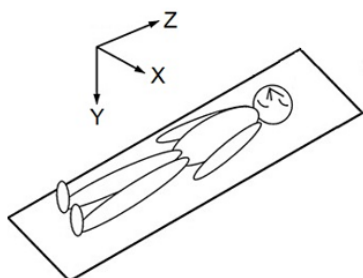

DICOM coordinate system

myQA SRS detector coordinate system

The RTDose are shown in three orientations:

- Transverse: X / -Y
- Coronal: X / Z
- Sagittal: -Y / Z

See the relationship between these two coordinate systems on the right. Illustration shows the RTDose coordinate system (X, Y, Z) and detector (therefore the resulting dose) coordinate system (Xd, Yd) when the detector in-phantom rotation is 0°, i.e., the myQA SRS detector plane and coronal plane overlap.
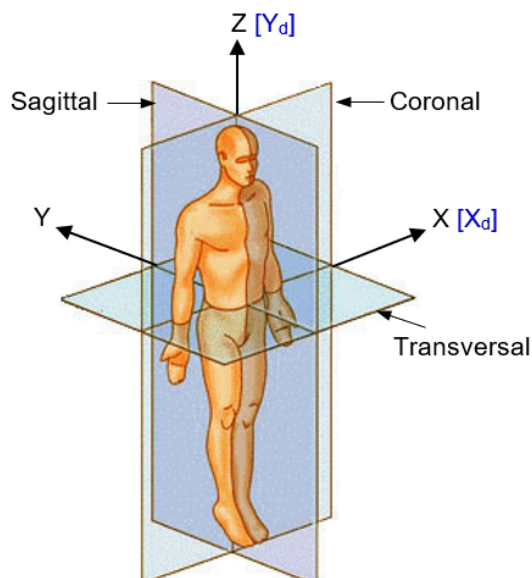
1.3.   General Workflow

Prerequisites

Calculate QA plan on the myQA SRS phantom and export DICOM files of RTDose and RTPlan (if available) to a location accessible by the IBA Plane Viewer Tool.

➤ Double click the file, PlaneViewerTool.exe.

➤ Click the **Import Dicom Files** button. Select both RTDose and RTPlan (if available) files and then click the **Open** button [Section 2.2]

➤ Move through the dose cube by placing the mouse-cursor on an image and scrolling the mouse wheel to visualize all planes to get an overview of the whole 3D dose distribution

➤ Click the **Reset view** button if desired [Section 2.4]

➤ If shift is needed, e.g., to set up the detector center for the best detector position with multiple high dose regions measurable in one setup, use the shifting sliders in the **Detector center** group [Section 2.6]

➤ To set up the angle of the detector in-phantom rotation, use the controls in the **Detector rotation** group [Section 2.5]*

➤ If there is a shift, QA plan recalculation with the shifted isocenter position must be done in the TPS. Afterwards, restart the workflow after importing the new RTPlan and RTDose files

➤ If there is no shift, then copy and save the myQA SRS detector settings for later use [Section 2.8]

*: During a measurement, the myQA SRS device used in a myQA SRS phantom can be rotated along the inline axis. The rotation angle can be entered into the **In phantom rotation** box in the **myQA Patients** application > **Measurement Configuration** dialog > **Detector** tab:
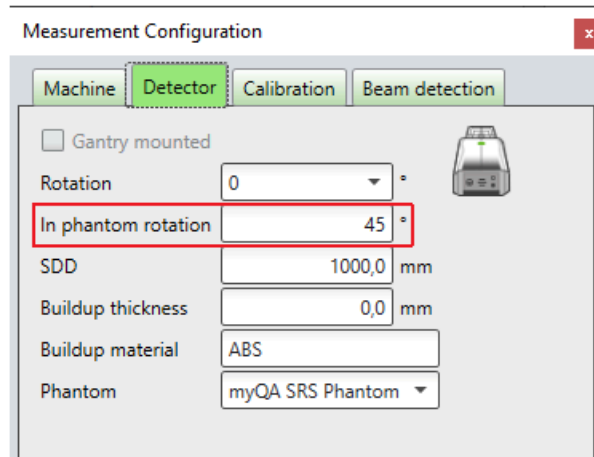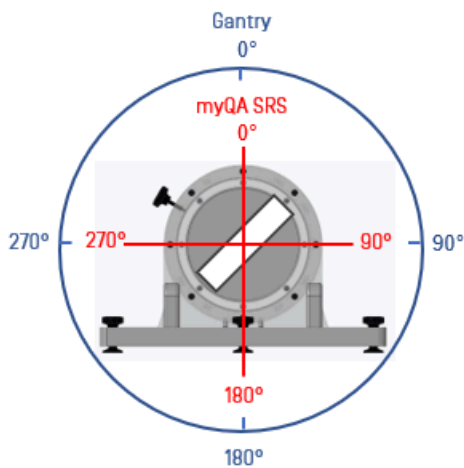
*Left: Illustration of the myQA SRS rotation and gantry rotation. Right: The **Measurement Configuration** dialog in myQA Patients.*

2. Software Description

2.1. Window Structure
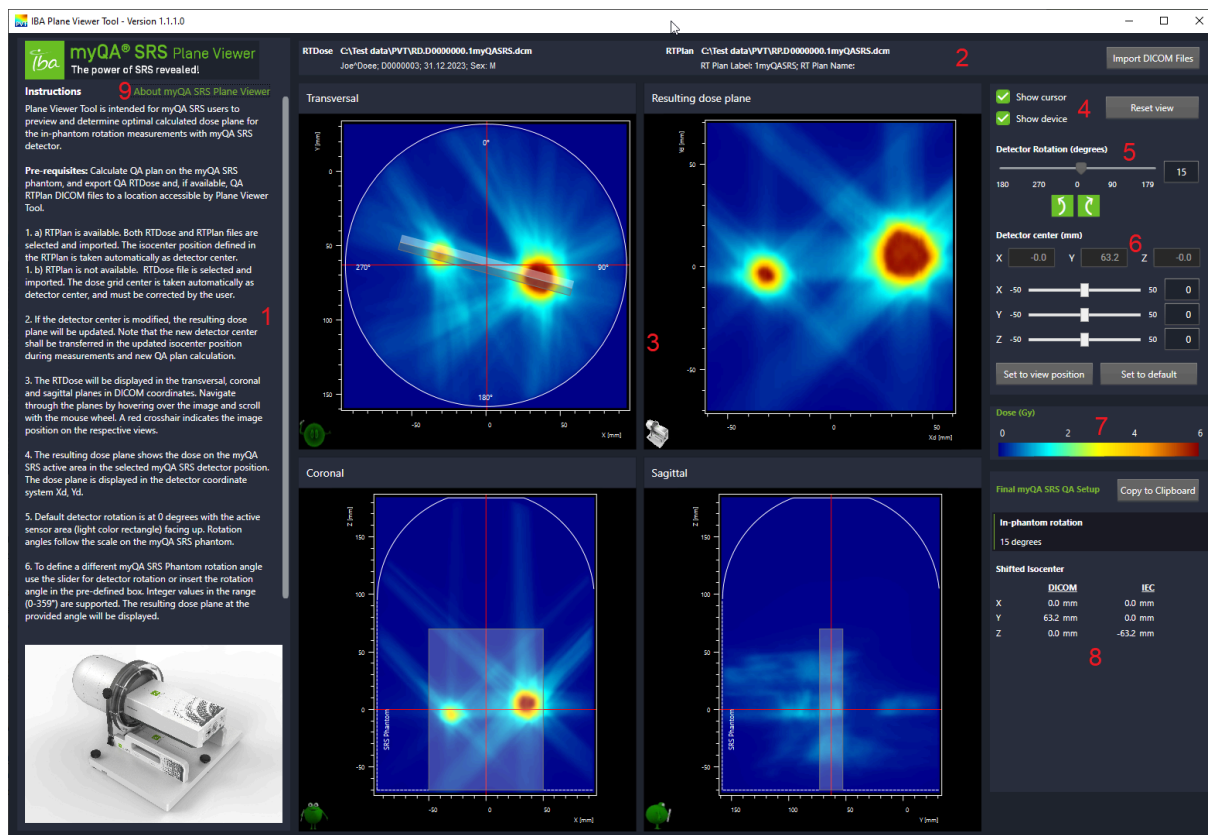
IBA Plane Viewer Tool

The Viewer consists of the following groups:

1: Instructions: displays the workflow (also see Section 1.3)

2: Import DICOM files (Section 2.2)

3: Dose distribution view (Section 2.3)

4: View options (Section 2.4)

5: Controls for in-phantom-rotation-angle (Section 2.5)

6: Controls for detector center (Section 2.6)

7: Color bar for dose values (Section 2.7)

8: Overall myQA SRS settings (Section 2.8)

9: Click to open the **About** box

Check for Software update

By clicking **About myQA SRS Plane Viewer** [9] above the instructions, the **About** box will open.

By clicking **Check for update** [10], the SW will check the website [11]. If the website version is newer than the current version, this website will open for downloading the newer version of IBA Plane Viewer Tool.
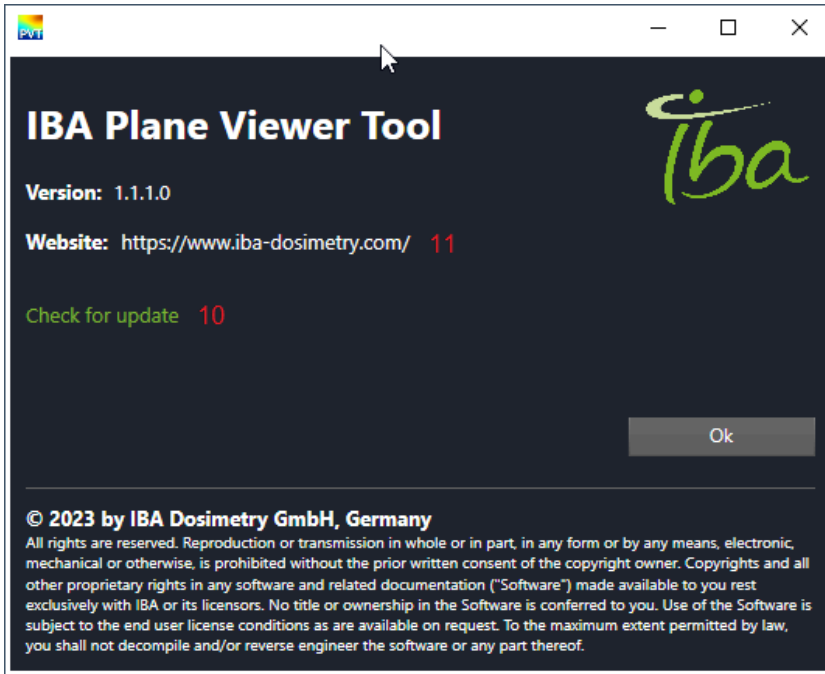
The **About** box

2.2. Import DICOM Files

Each import must contain an RTDose file. For a conventional LINAC, both RTDose and RTPlan files should be imported together. The detector center will be aligned with the dose cube isocenter provided by the RTPlan.

However, for Cyberknife, only RTDose is available to be imported. By default, the detector center will be aligned with the dose cube center.
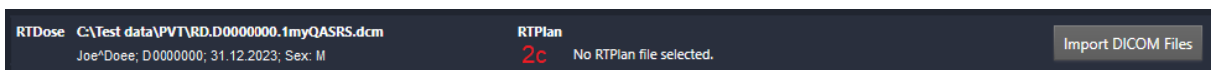
For more information about the detector center, see Section 2.6

Note: Please see Prerequisites in Section 1.3 to prepare the DICOM files for import.

➤ Click the **Import Dicom Files** button [2a]. A file **Open** dialog opens.
➤ Select both RTDose and RTPlan files or only RTDose [in case of Cyberknife].
➤ Click the **Open** button.
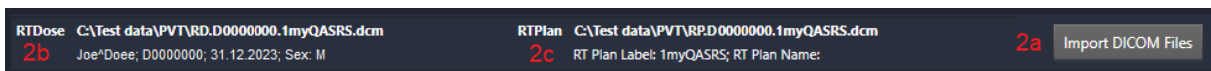
Both RTDose and RTPlan files are imported

Only RTDose is imported. It is also indicated that no RTPlan is imported [2c]

After import, the following information is displayed if available in the DICOM files:

RTDose file [2b]: full file path and the information in the file, i.e., patient's name, ID, date of birth, and gender

RTPlan file if imported[2c]: full file path and the information in the file, i.e., the RT Plan Label and RT Plan Name

When both RTDose and RTPlan files are selected for import, a warning message pops up if the patient's name is not identical in Plan and Dose and if the SOP Instance UID from plan does not correspond to the Referenced SOP Instance UID from dose.
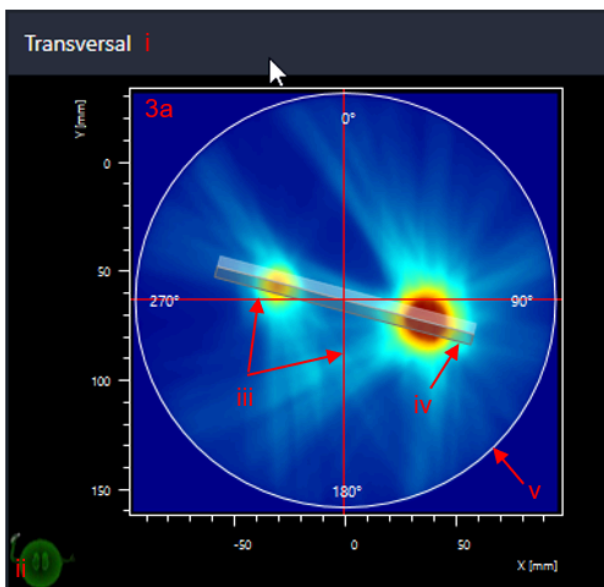
2.3. Dose Distribution Visualization
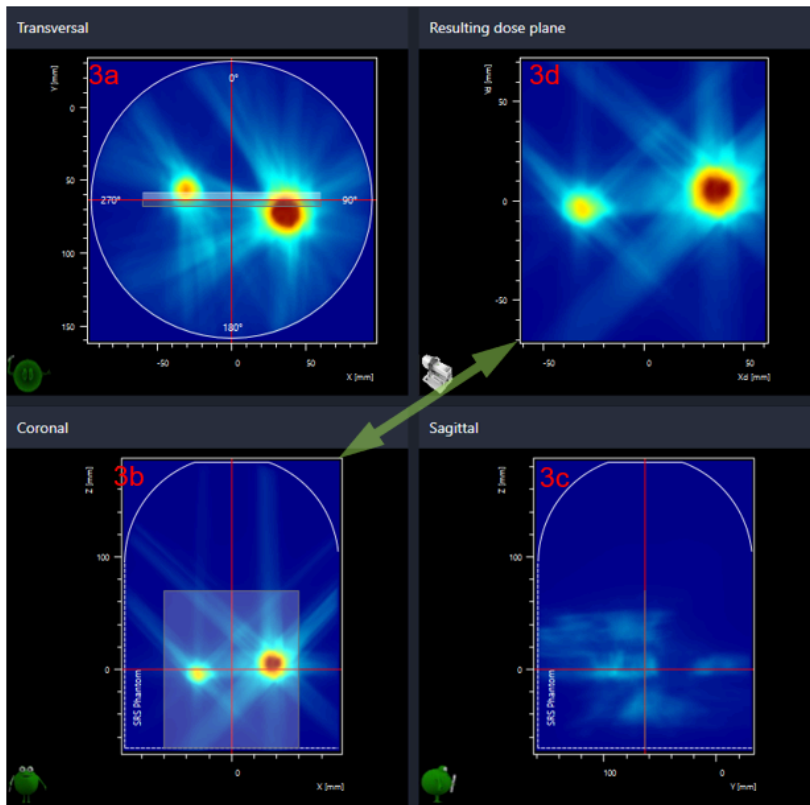
Example: Dose distribution view includes three orientations of RTPlan: transversal [3a], coronal [3b], sagittal [3c], and RTDose [3d]. At in-phantom-rotation 0°, the resulting dose plane is at the coronal plane.

2.3.1. RTDose Display

The three orientations have the same display features. See an example for the transversal orientation:

*Example: **Transversal** view. i: Orientation, ii: Orientation icon, iii: Cursors of current plane position, iv: Contours of the detector [The translucent white area indicates the upper part of the detector], v: Contours of the phantom area*

<u>Axis</u>

The axes are labeled with X, Y or Z in mm.

<u>Changing plane to be displayed (changing viewing position)</u>

The plane to be displayed can be changed by placing the mouse cursor on one of the orientation views and scrolling the mouse wheel up and down. It changes the axis that is orthogonal to the current axes of the image, e.g., by scrolling the mouse wheel on the **Transversal** view, the z-axis is changed, and consequently, the image on the **Transversal** view and the Z-cursors on the **Coronal** and **Sagittal** views will be changed accordingly. See moving directions below:

View orientation	Moved axis	Axis moving direction
Transversal	Z	Mouse up: +; down: -
Coronal	Y	Mouse up: -; down: +
Sagittal	X	Mouse up: +; down: -

Note: *Moving the view position does not have any impact on the detector position within the cube. By scrolling through the cube, the contours of the phantom and detector area will not be adapted according to the current view position.*

2.3.2. Resulting Dose Plane View
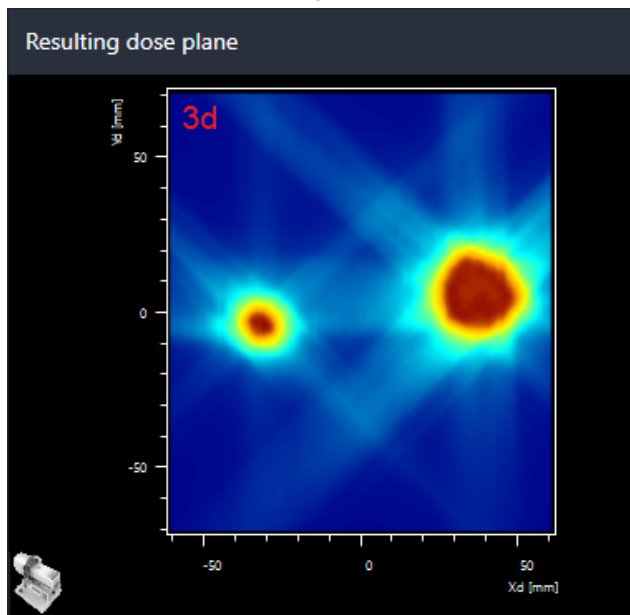
The **Resulting dose plane** view

The dose distribution calculated on the myQA SRS detector plane is displayed on the upper-right pane. The axes are labeled with Xd and Yd in mm.

Note: *The detector position and thus the resulting dose plane is not affected by changing the RTDose plane position.*

2.4. View Options

Reset view:	Sets the view position to the current center of the detector, i.e., sets the view position to the current center of the detector or in-phantom rotation angle.
Show cursor:	Hides or shows the crosshair for the view position.
Show device:	Hides or shows the phantom and detector area

2.5. Controls for Detector Rotation

A set of controls is available to define the angle of in-phantom rotation. Whenever the angle value has changed, the displays of **Resulting dose plane**, **Transversal**, **Coronal** and **Sagittal plane** changed accordingly.

The angle of in-phantom rotation can be set as follows:

➤ Moving the slider [5a] for rough changes of the angle

➤ Entering a value (integer) in the box 5b

➤ Clicking the buttons [5c] for clockwise / counter-clockwise for step change of an angle (step + / - 1°)

2.6.   Controls for Detector Center

6a: Coordinates of the detector center

6a and 6c: For shifting the detector center position

Set to view position button:

Shift detector center to the viewing position set by scrolling the mouse on one of the **Transversal**, **Coronal** and **Sagittal** views (see Section 2.3.1).

Set to default button:

Cancels the detector shifting and sets the detector center back to the default position

Shift of the detecor center

Each axis can be moved in a defined range by moving the corresponding slider (6b) or entering shift values in the corresponding box (6c), to move the detector to a different position than the Isocenter. The resolution of the sliders is +/- 1 mm. The minimum / maximum range from -50 mm to 50 mm by default. If the defined view position is out of range, an error is shown, and the detector position is not changed.

Whenever the detector center has shifted, the display in **Transversal**, **Coronal**, **Sagittal** and **Resulting dose plane** panes are adapted accordingly, and a warning will appear:.
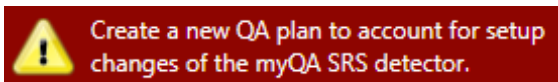
That is, the isocenter will be shifted according to the shift of the detector. The resulting plan will also be updated accordingly. The shifted detector centor/isocenter position must be taken into account during meaurements and the new QA plan calculation.

Import RTPlan and RTDose Simultaneously (conventional LINACs)

By default, after importing RTPlan and RTDose, the detector center is aligned with the isocenter according to the isocenter in the RTPlan. The coordinates are displayed (6a) and are not editable.

### Import RTDose only (Cyberknife)

By default, after importing RTDose, the detector center is aligned to the center of the dose cube. The coordinates of the actual detector center must be entered by editing the **Detector center** boxes (6a).

Configuring minimum or maximum shift

To change the default minimum / maximum shift to a different value,

- open the config.json file in the folder, "%ProgramData%\IBA Dosimetry\PlaneViewerTool",
- use a text editor (e.g., notepad) to define the minimum / maximum shift for each axis in a file.

2.7.   Color Bar for Dose Values
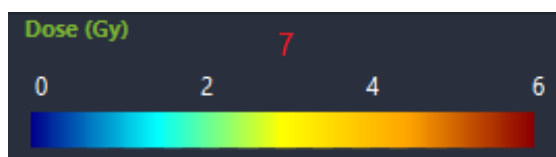
The color bar [7] applies to all 4 images [Transversal, Coronal, Sagittal, and Resulting dose planes]. The mapping from the dose value to the color is shown in the color bar. The minimum and maximum values on the color bar are set automatically taken from the imported RTDose. The unit is displayed according to the unit given in the RTDose file, "Gy".

2.8.   Final myQA SRS QA Setup

This section displays the overall setup defined for the detector in-phantom rotation angle [8a] and the resulting shifted isocenter [8b]. By clicking **Copy to Clipboard**, the settings will be copied to clipboard for pasting to any text editors.

3. Technical Support

3.1. Contact for Technical Support

If you need technical support, please contact the local IBA Dosimetry GmbH representative first. If you need any further assistance, please contact:

USA, Canada, Latin America	Europe, Middle East, Africa	Asia Pacific
Phone: +1 786 288 0369	Phone: +49 9128 607 38	Phone: +65 3129 2472
service-usa@iba-group.com	service-emea@iba-group.com	service-apac@iba-group.com

3.2. Reporting Complaints

The Quality Management system of IBA Dosimetry GmbH includes a routine to handle any reported complaints.

All complaints about the product should be report to any representative of IBA Dosimetry GmbH or directly to the technical support, see the contact information in the above section.