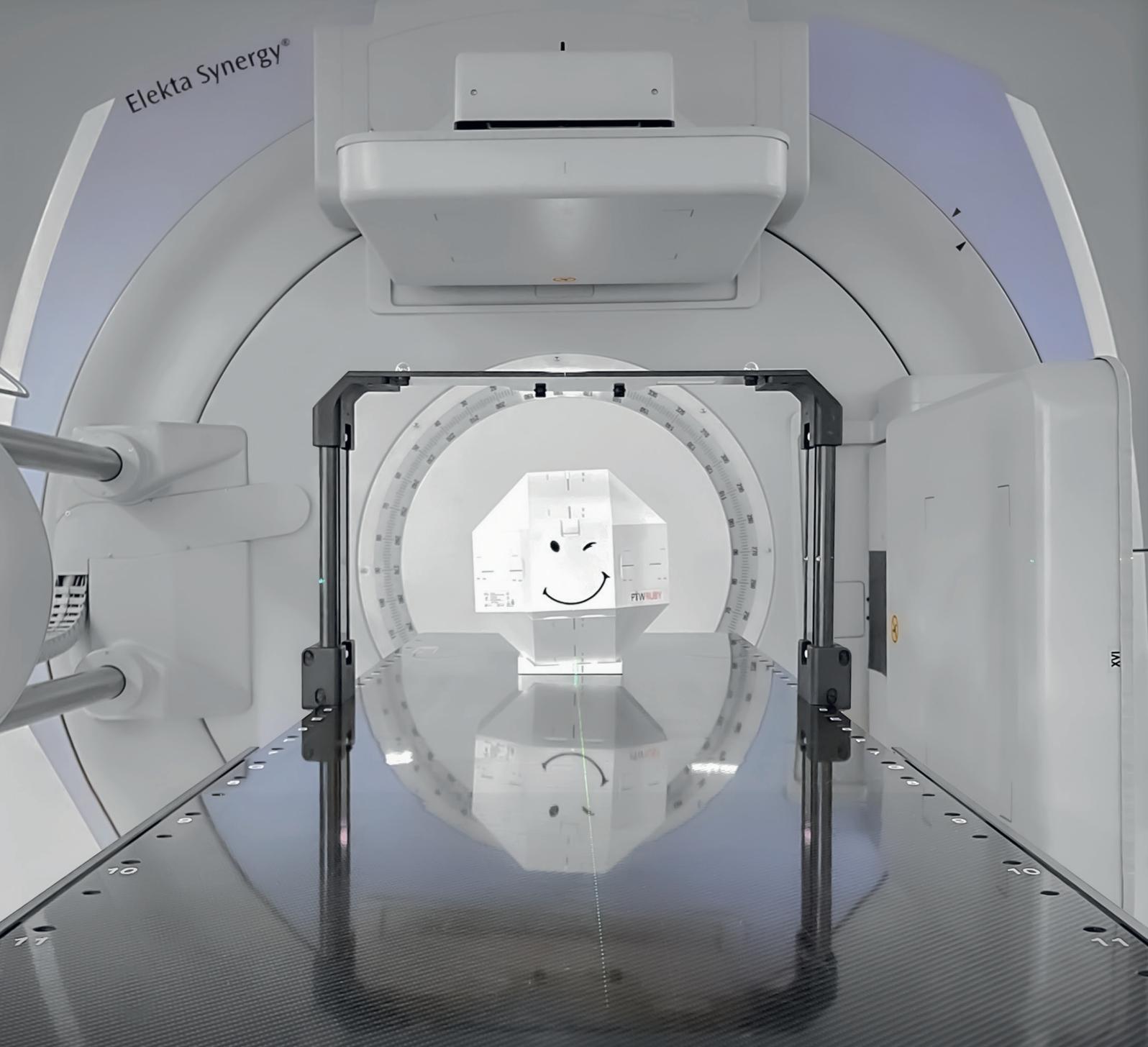


Elekta Synergy®



# RUBY Linac QA Set with Elekta IGRT systems

# System Overview

The RUBY Linac QA Set consists of the RUBY base phantom, the RUBY Linac QA insert and the RUBY tilted base. The insert contains four cylinders made of bone-equivalent material and a ceramic ball in the center. The RUBY insert easily locks into the base phantom making it fast, error-free and ready to use.



Figure 1: Center: RUBY base phantom / Left: RUBY tilted base / Right: RUBY Linac QA insert

The phantom has three lines and three CT markers. CT markers made of bone-equivalent material with a diameter of 2 mm mark the center of the phantom and allow precise and easy definition of the isocenter position in the TPS as shown in Figure 2.

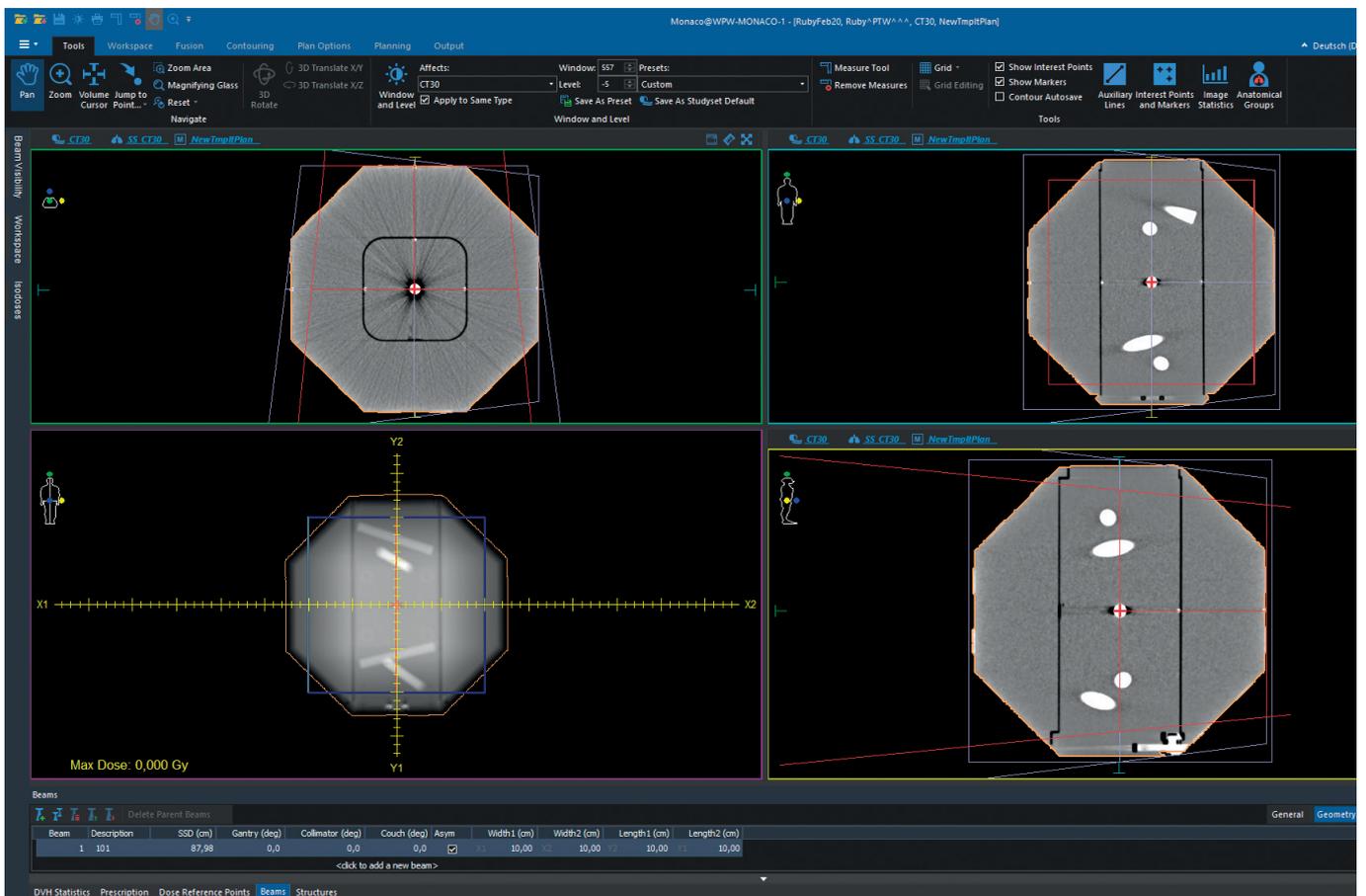


Figure 2: Preparation of the QA workflow using Monaco: Isocenter definition based on the RUBY CT marker made of bone equivalent material. The lines mark the center of the phantom (black) as well as a displacement (grey) and a displacement including defined rotation of the phantom (red) as shown in Figure 3.



Figure 3: RUBY with defined misalignment positioned on the couch. Left: grey line markings with defined misalignment. Right: red line markings with defined misalignment and defined rotation using the RUBY tilted base.

## CBCT

### 3DoF couch

The RUBY Linac QA Set enables fast and accurate verification of patient positioning workflows on 3DoF couches. Figure 4 shows the results of the registration using Elekta XVI system and "grey scale" registration algorithm. The system is also compatible with "bone" registration method.

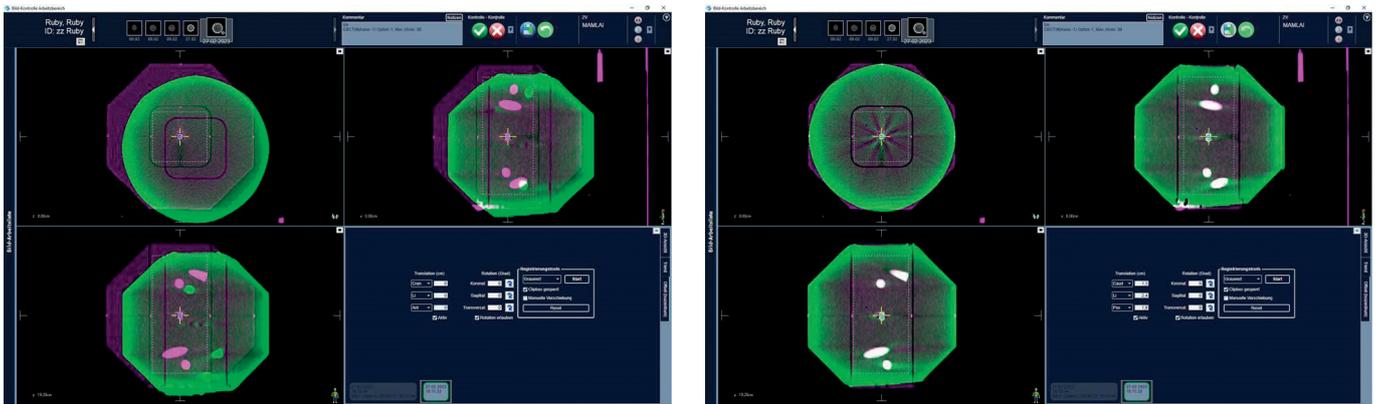


Figure 4: CBCT registration using Elekta "grey scale" algorithm, RUBY with defined misalignment using the grey line markings. Left: Before registration. Right: After registration

### 6DoF couch

6DoF couch systems enable the correction of rotational patient positioning errors. The RUBY Linac QA Set enables fast and accurate verification of the correction of 6DoF couch systems like the Elekta HexaPOD™ evo RT system. Figure 5 shows the registration using Elekta XVI system and "bone" registration algorithm. The system is also compatible with "grey scale" registration method.

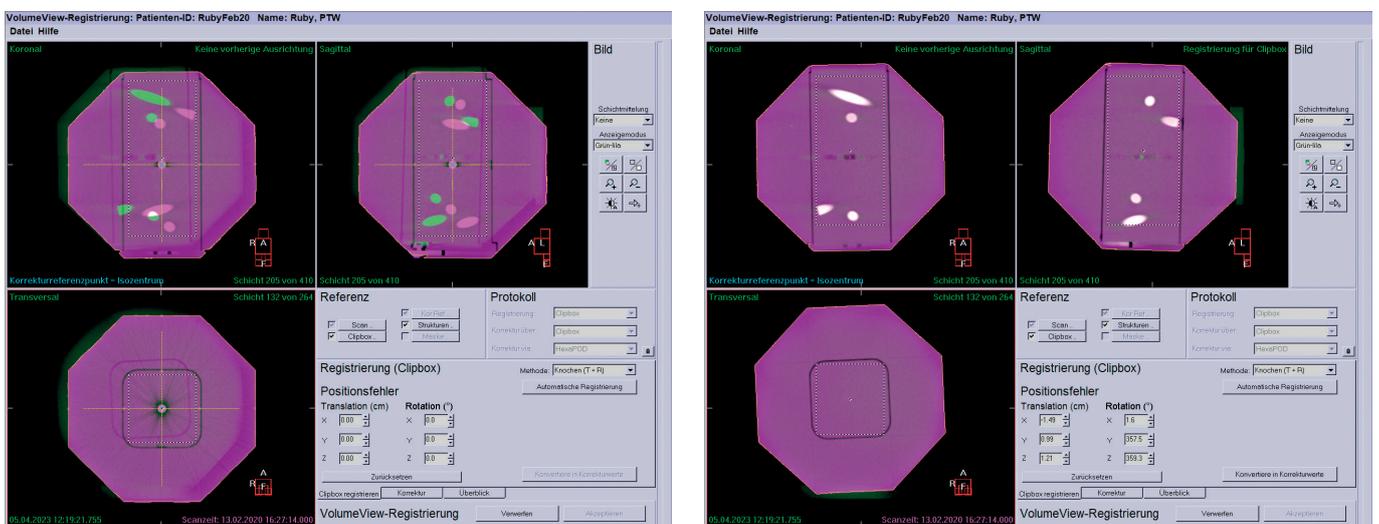


Figure 5: CBCT registration using Elekta "bone" algorithm, RUBY at Elekta HexaPOD™ evo RT couch with defined misalignment and defined rotation using the red line markings and the RUBY tilted base. Left: Before registration. Right: After registration

# Stereoscopic registration

Because the bone cylinders are visible in MV as well as kV images, the RUBY Linac QA set is perfectly suitable for checking stereoscopic matching with MOSAIQ®.

## MV / MV

MV images are still used for patient positioning. The standard is a 0° / 90° orientation, but other combinations are also clinically accepted. The QA of stereoscopic MV image registration can be performed quickly and easily with the RUBY Linac QA Set.

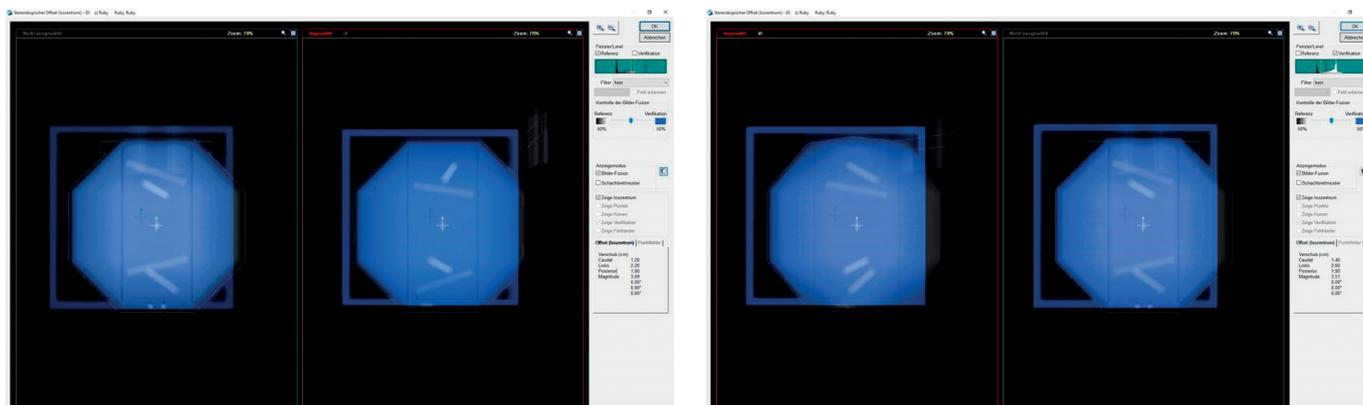


Figure 6: QA of stereoscopic MV image registration with MOSAIQ®, RUBY with defined misalignment using the grey line markings. Left: After registration with 0° / 90° MV images. Right: After registration with 0° / 50° MV images.

## kV / kV

Patient positioning can also be performed with planar kV images. The QA of stereoscopic MV image registration can be performed quickly and easily with the RUBY Linac QA Set.

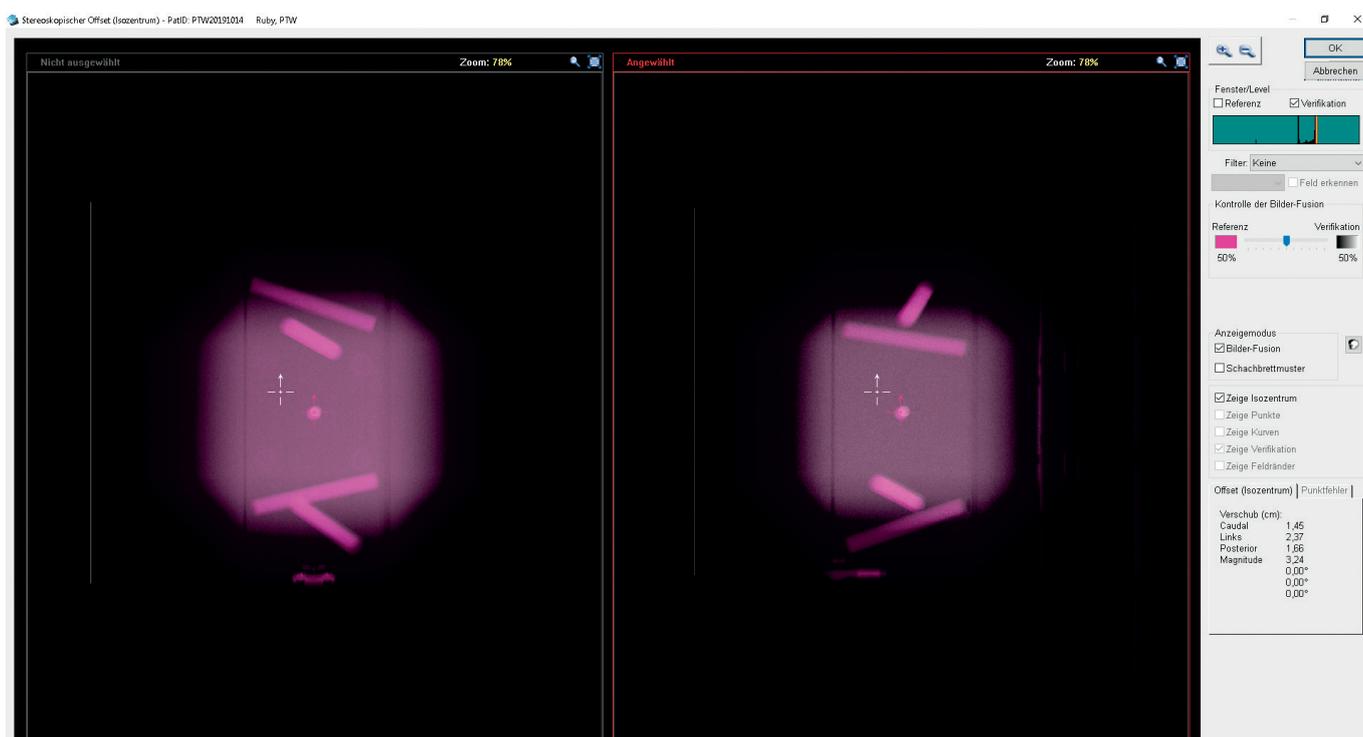


Figure 7: QA of stereoscopic kV image registration with MOSAIQ®, RUBY with defined misalignment using the grey line markings.

# SGRT

SGRT systems are increasingly being used in radiotherapy. The integration of SGRT systems into the QA workflow is now essential to ensure a consistent quality check. The RUBY Phantom is visible in SGRT systems. This allows the integration of the SGRT system into the QA workflow using the RUBY Linac QA Set.

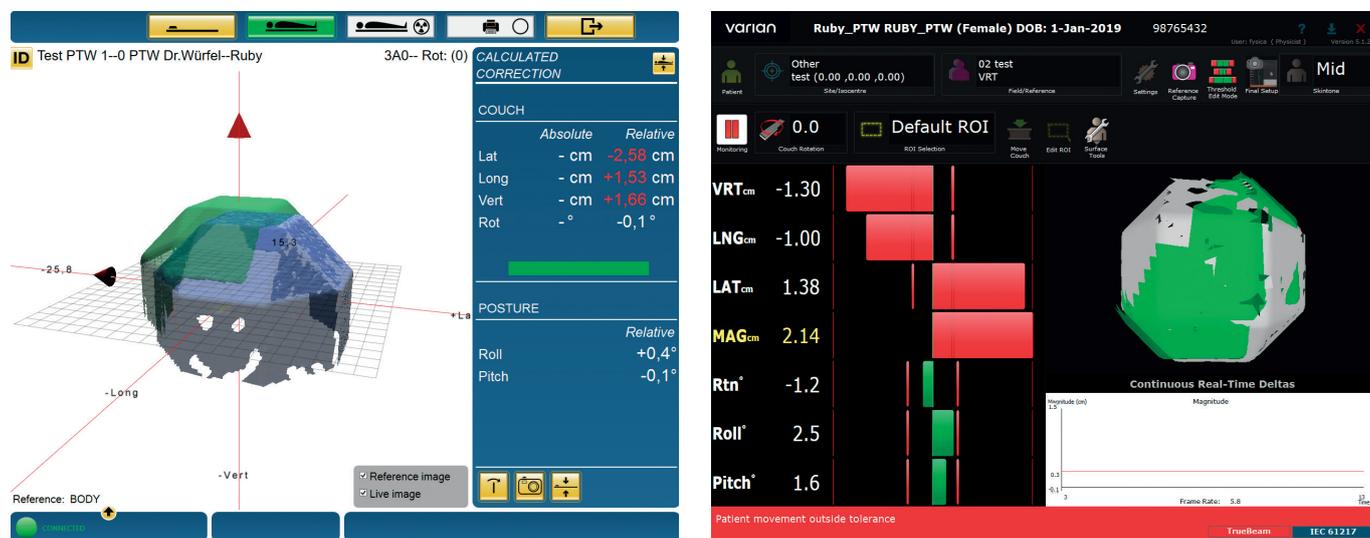


Figure 8: Left: C-RAD SGRT system and RUBY Linac QA Set with defined misalignment using the grey line markings. Right: VisionRT SGRT system, RUBY Linac QA Set with defined misalignment and rotation using the red line markings and the RUBY tilted base.

## RUBY Set information

- L981637 RUBY Linac QA Set
- T40072.1.001 RUBY base phantom
- T40072.1.200 RUBY insert Linac QA
- T40072.1.030 RUBY tilted base





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