

# DIBH breast VMAT treatments using AlignRT InBore in Halcyon

Laurence Delombaerde<sup>1,2</sup> PhD, Saskia Petillion<sup>2</sup> PhD, Caroline Weltens<sup>1,2</sup> MD PhD, Tom Depuydt<sup>1,2</sup> PhD

<sup>1</sup>KU Leuven - University of Leuven, Department of Oncology, B-3000 Leuven, Belgium

<sup>2</sup>University Hospitals Leuven, Department of Radiation Oncology, B-3000 Leuven, Belgium

contact: laurence.delombaerde@uzleuven.be

## Purpose

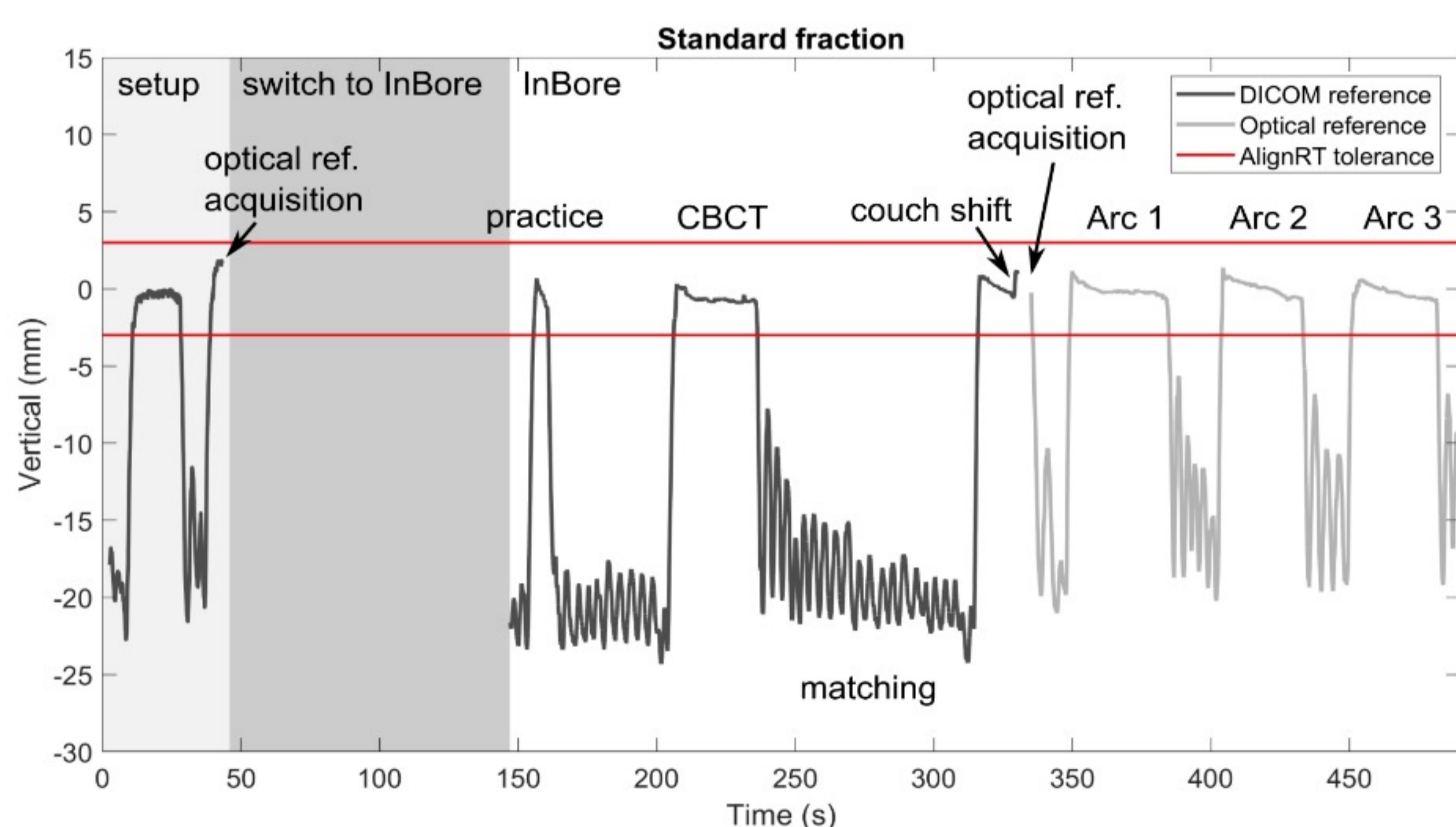
Surface guidance has the advantage of being a non-contact and non-ionizing positioning and DIBH modality. VisionRT Ltd. introduced the AlignRT InBore system for SGRT in a closed-bore linac (Halcyon, Varian Medical Systems). In this study we treated **left-sided breast cancer patients in breath-hold** and assessed the positional accuracy and workflow efficiency.

## Methods

6 left-sided breast cancer patients were included (ages 65-69)

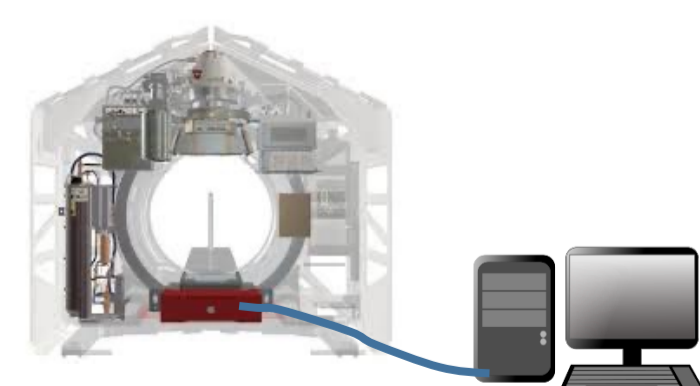
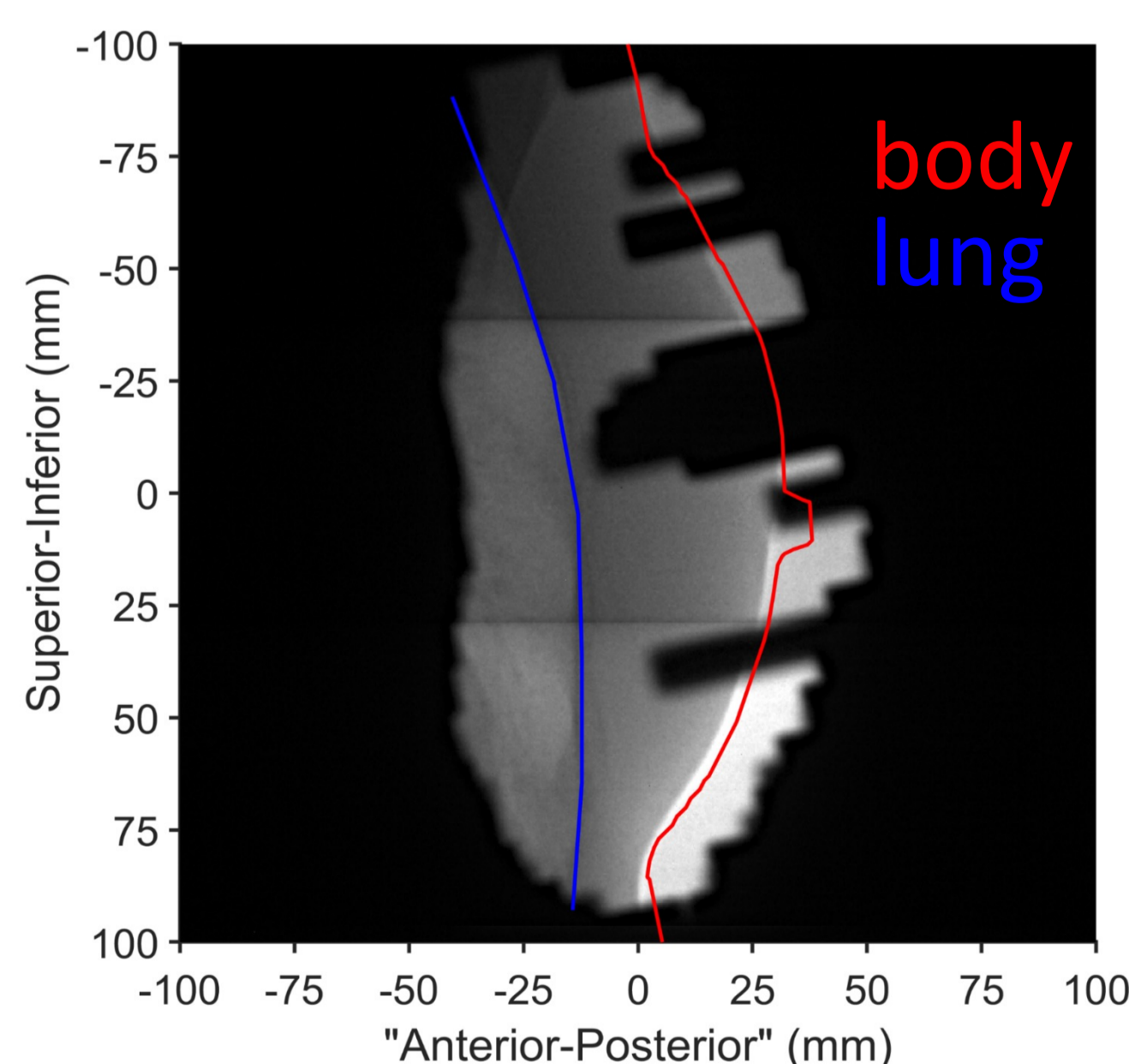
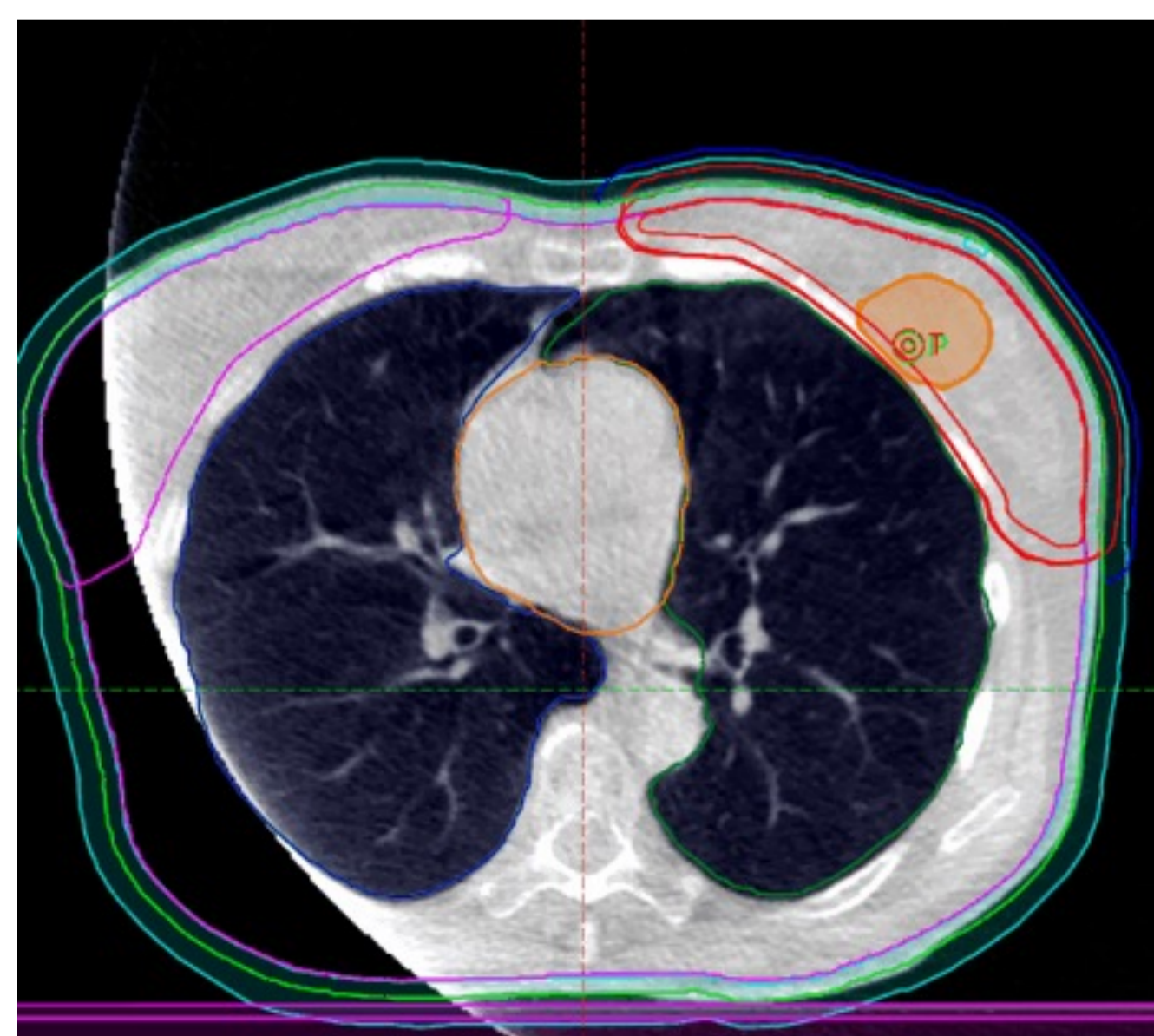
21 fx of 2.66 Gy to tumor bed/2.17 Gy to whole breast (VMAT-SIB)

Both patient setup and DIBH verification is performed with AlignRT (setup and InBore) where a standard fraction is as follows:



A fraction can be completed in 4 breath-holds (minus setup)

- (1) 17 sec. kV-CBCT
- (2) 3x 25 sec. partial arc



Portal images are acquired during treatment to assess inter and intra fraction error (Varian iTools)

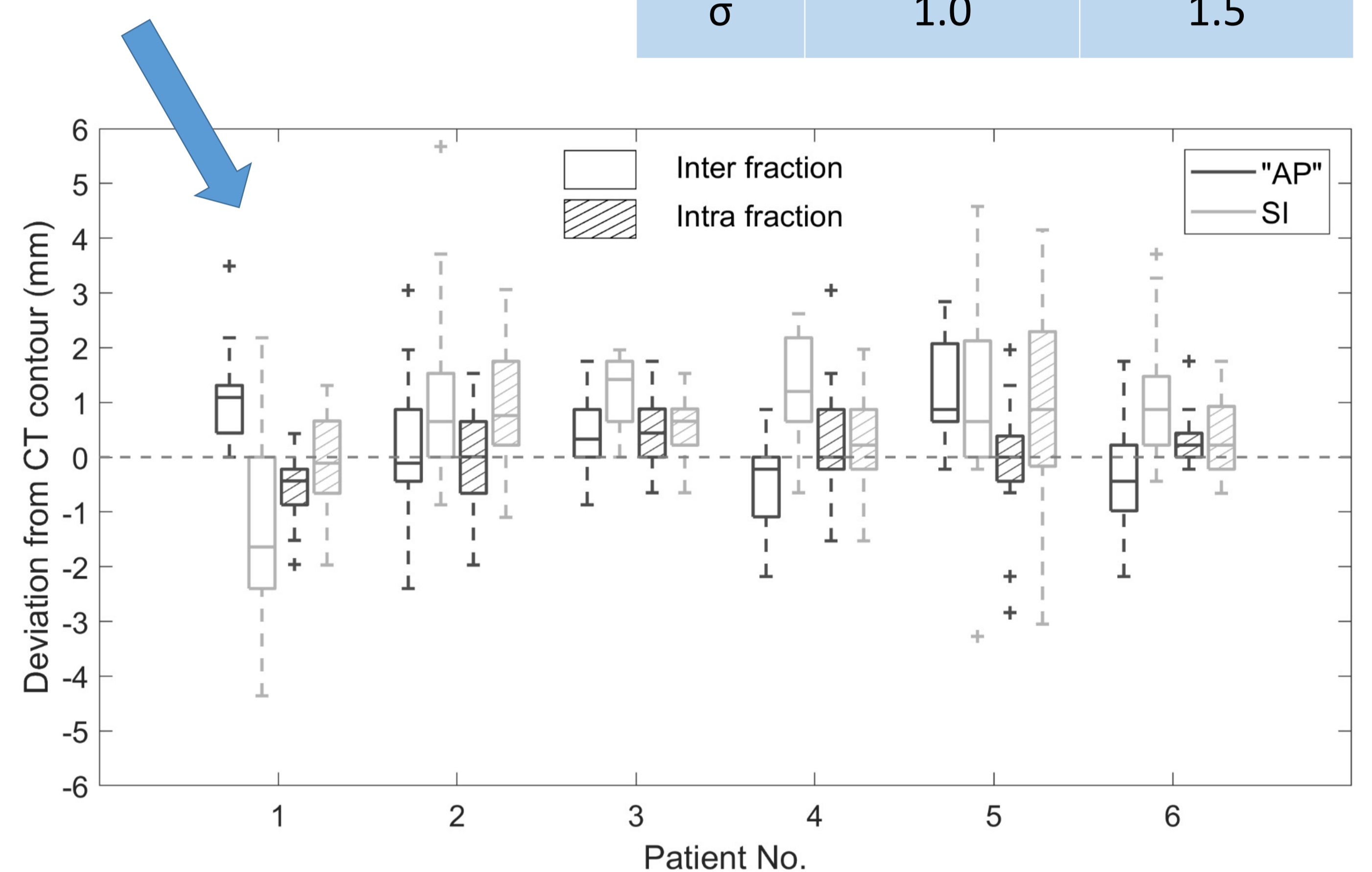
The workflow efficiency is extracted from Record & Verify system (ARIA) and AlignRT timestamps

## Results

Systematic and random errors:  
N = 92 fractions in total

	"AP" (mm)	SI (mm)
$\Sigma$	0.7	1.0
$\sigma$	1.0	1.5

per patient

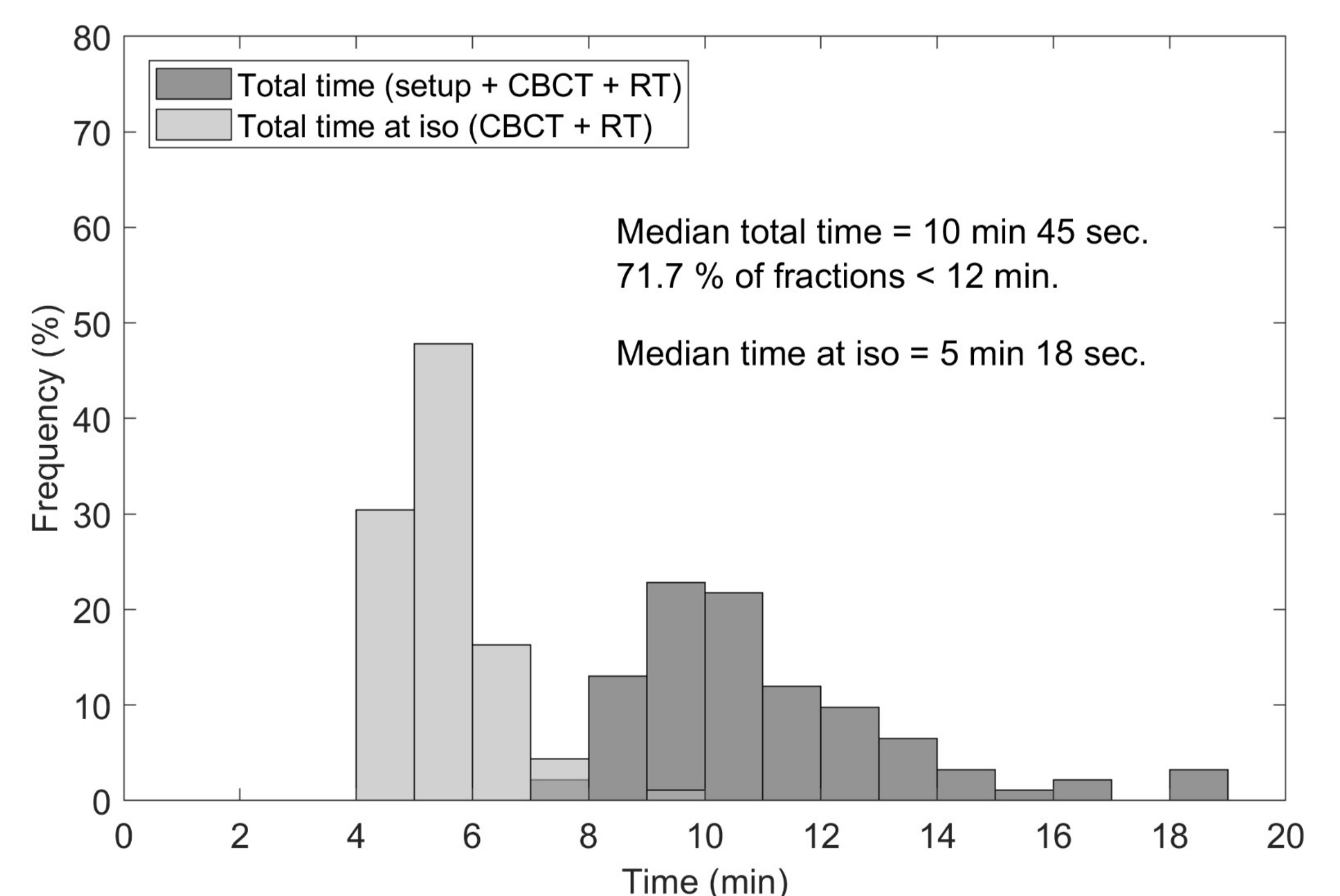


Patients spent median 96% of the total breath-hold within a  $\pm 2$  mm range

**90%** of fractions were completed in **4 breath-holds** (avg. 25 sec  $\pm$  5 sec)

Median time patients spent on the couch: **10 min 45 sec** of which **5 min 18 sec** is spent at the isocenter.

Treatments can be comfortably performed in 18 min timeslots (our standard for DIBH)



Mean online couch shifts are 2.1 mm (AP), 2.1 (SI) and 0.7 (ML)

## Conclusion

Fully surface guided DIBH workflows for left-sided breast cancer patients in the Varian Halcyon linac proved highly efficient with good inter and intra fraction reproducibility.