

SGRT BIG BENEFITS
BETTER WORKFLOWS



Surface Guided Respiratory Gating with AlignRT's Respiratory Module and DIBH for SABR lung

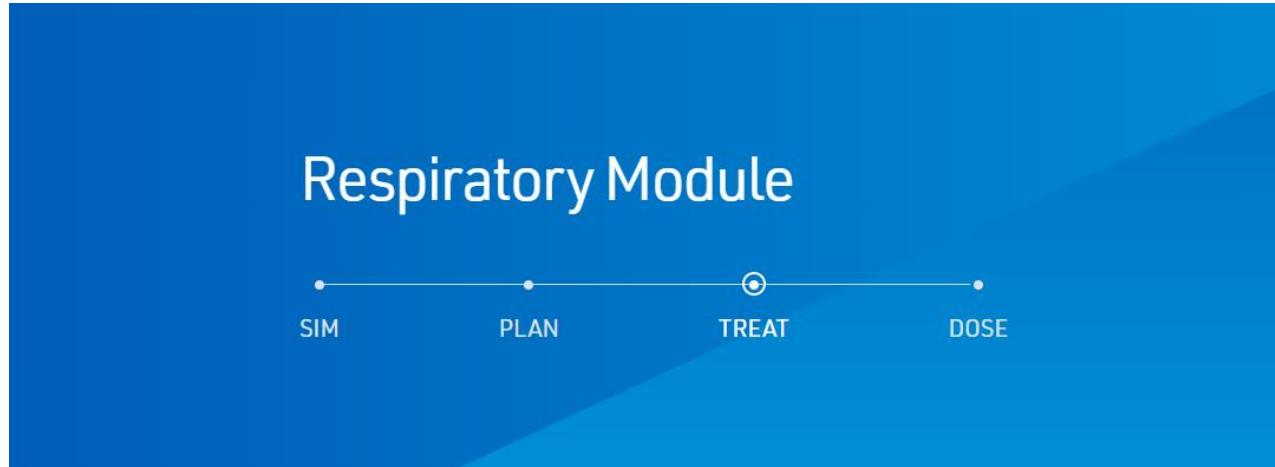
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Surface Guided Respiratory Gating with AlignRT's Respiratory Module

By Chloe Westlake-Allen

Kyle Noyce

Poole Radiotherapy Department

- 2 Sites – Poole and Dorchester
- 3 Truebeams in Poole
- 1 Truebeam in Dorchester
- Began using AlignRT in 2021
- Tattooless in 2023
- Respiratory Module in 2025

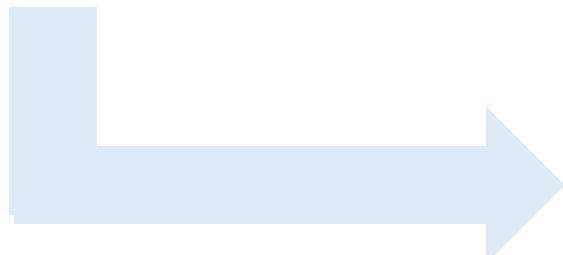




Motion
Management

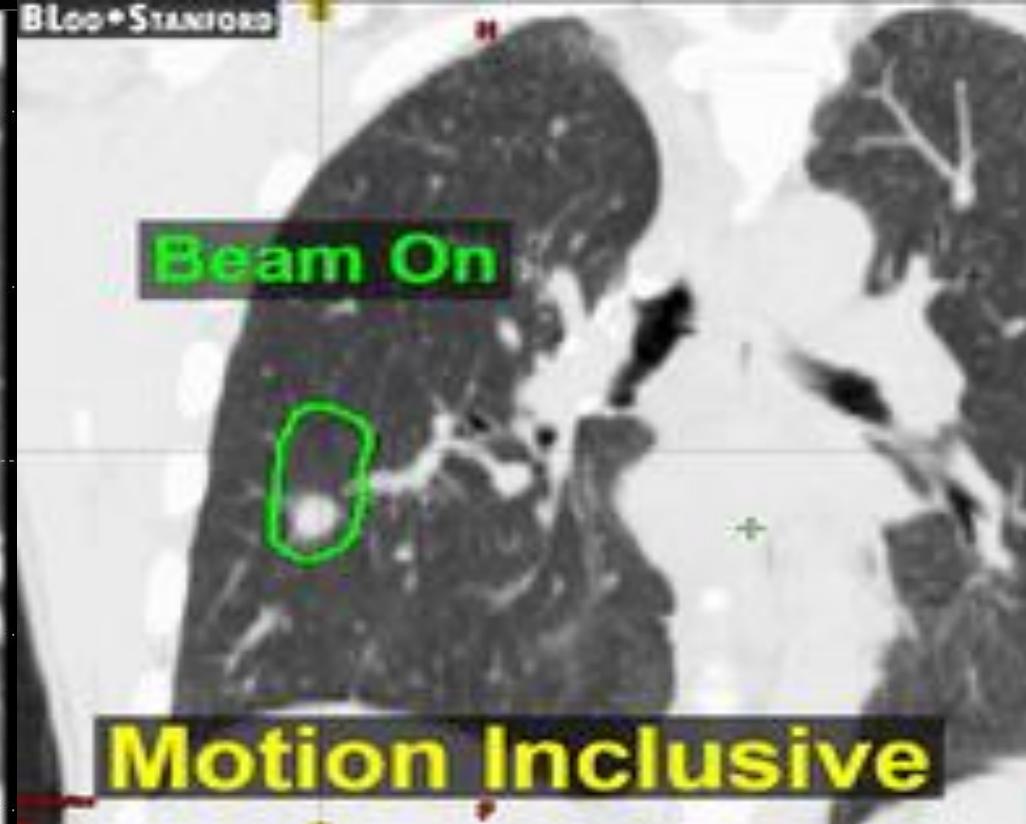
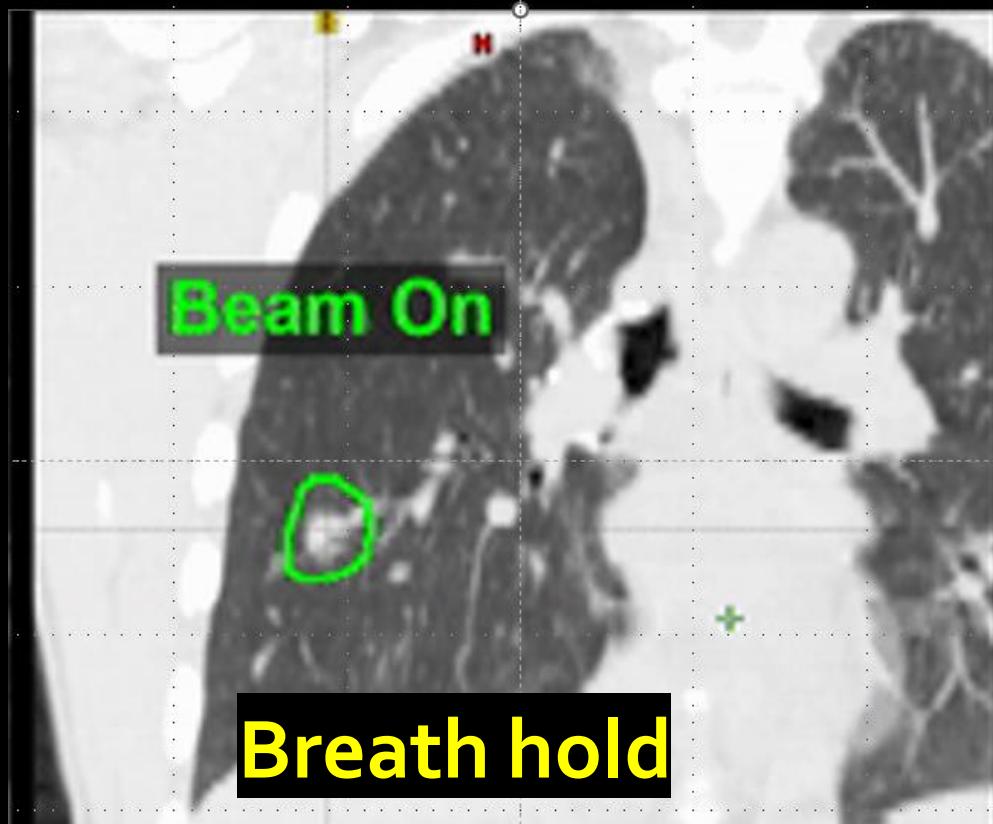


ITV



DIBH

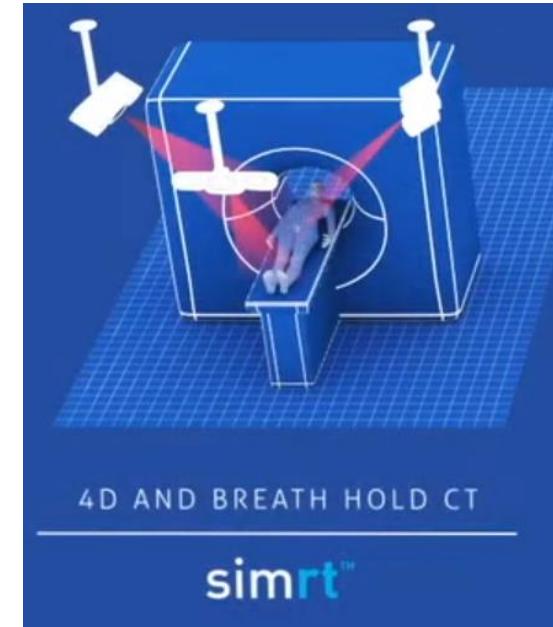
Lung treatment breathing motion mgmt





Pre-Treatment

SimRT



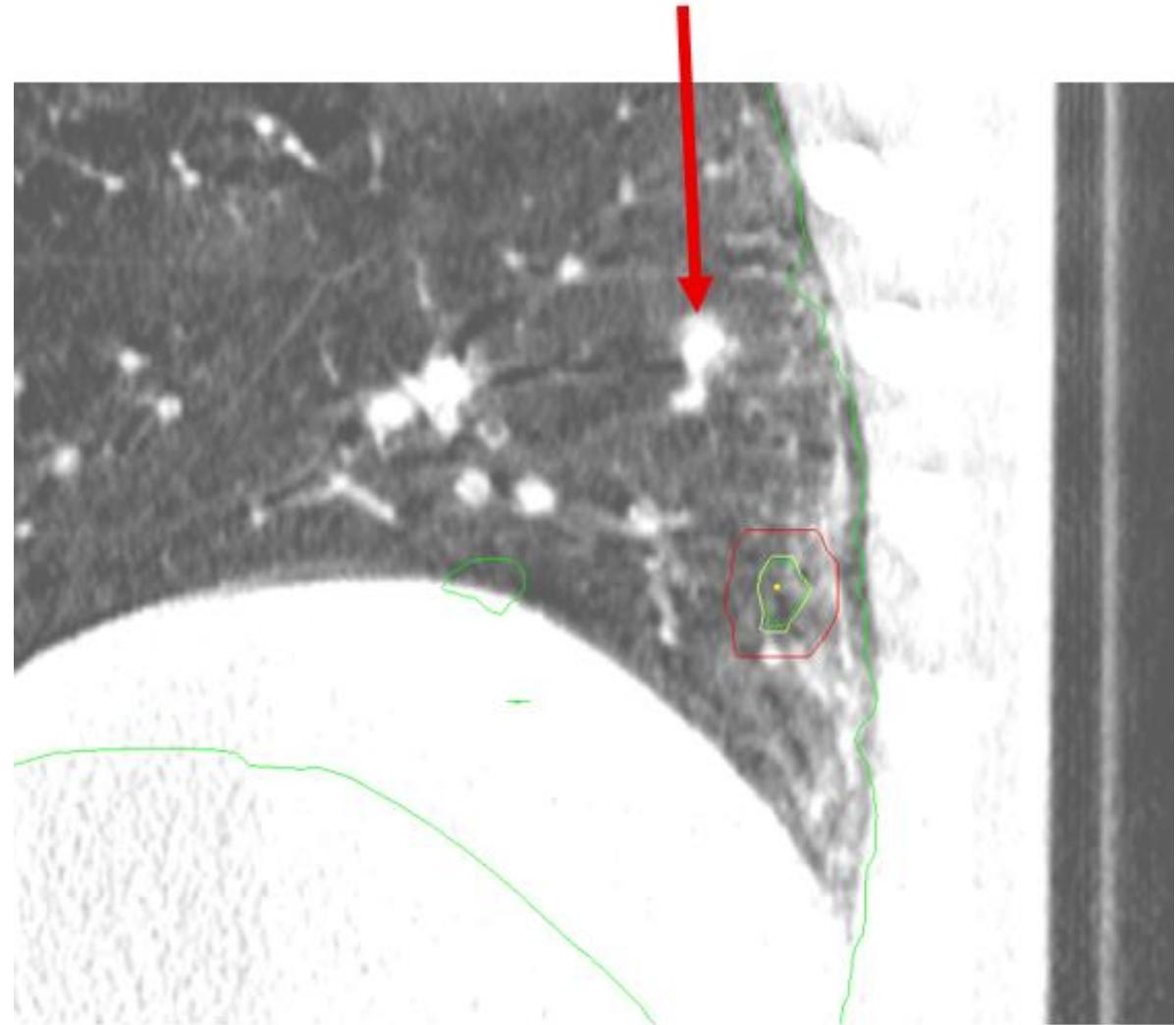
SABR DIBH

- We have scanned 8 SABR DIBH patients
- 6 successful completed treatments
- 2 patients were unsuccessful



Not everyone is suitable for DIBH

- Maintain
- Consistent
- Follow instructions
- Visible chest rise





Motion
Management

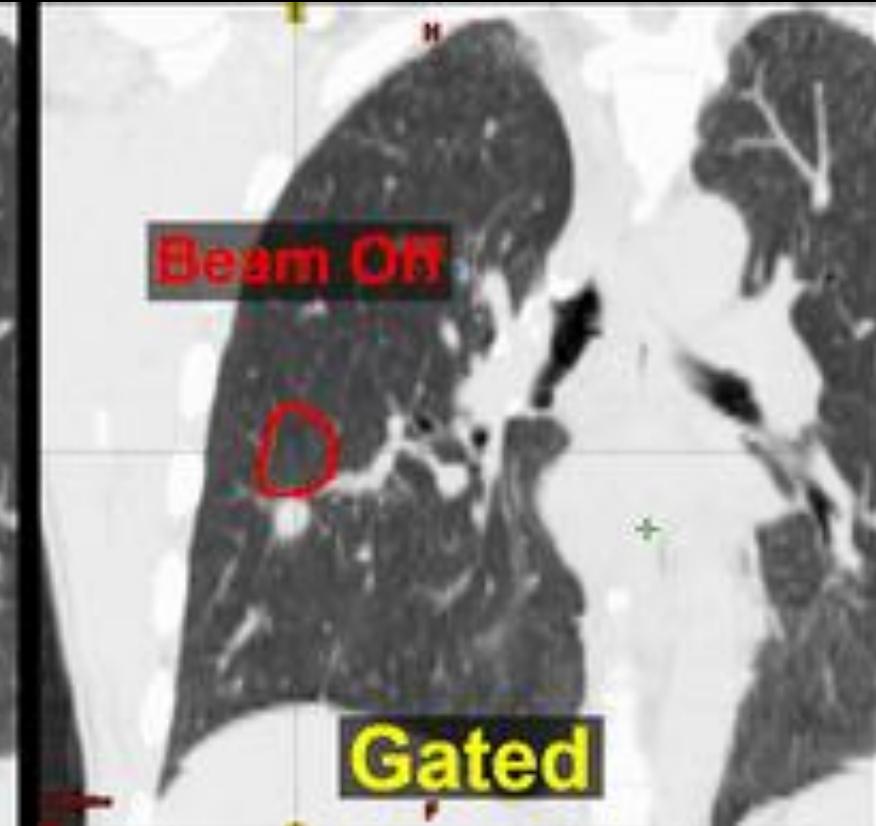
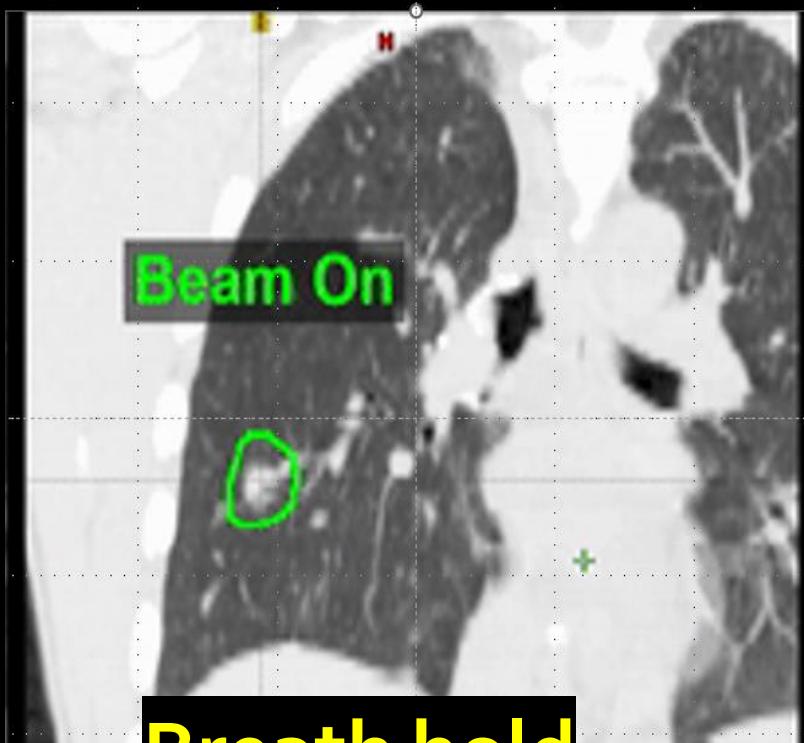
The diagram illustrates the relationship between Motion Management and three treatment techniques. A large black arrow originates from the text 'Motion Management' and points to the right. This main arrow then splits into three separate arrows, each leading to a box containing a technique name. The top branch leads to a white box containing 'ITV'. The middle branch leads to a green box containing 'GATING'. The bottom branch leads to a light blue box containing 'DIBH'.

ITV

GATING

DIBH

Lung treatment breathing motion mgmt



Back Up Gating

- 3D CBCT
- Amplitude based gating
- Thresholds above the peak and below the trough



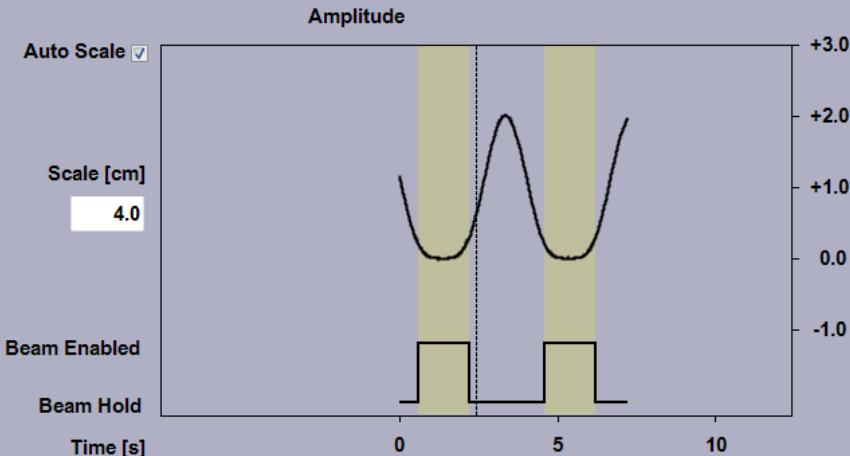
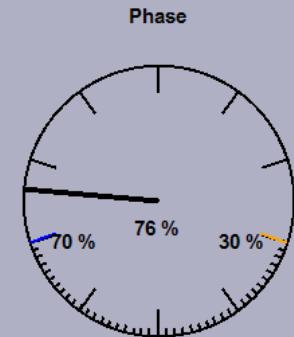
Phase or Amplitude Based Gating

- 4D CBCT
- Amplitude or phase based prospective gating





Review of the actual reference curve



Planned gating thresholds

Upper Threshold [%] 70

Lower Threshold [%] 30

Record a new reference curve

Start **Stop**

Original gating thresholds from reference curve

Planned gating thresholds

Periodicity

Good — Poor

Duty Cycle [%] 40.5

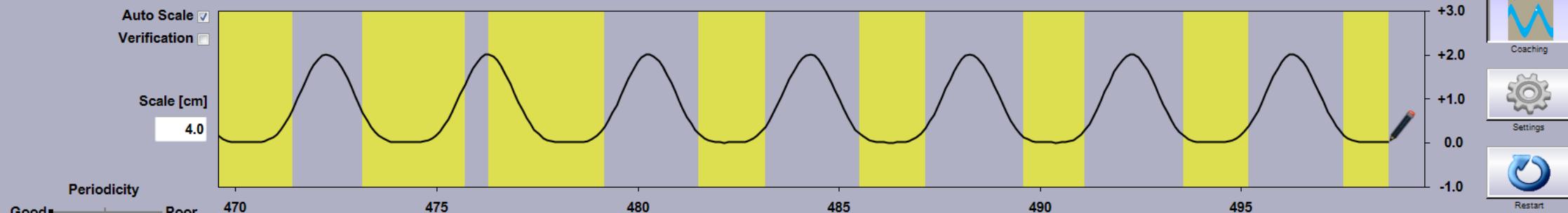
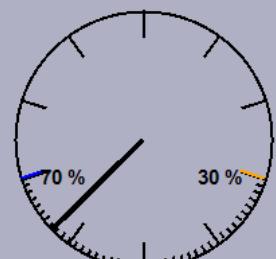
Gated Motion [cm] 0.28

Inspiration [s] 2.0

Expiration [s] 2.0

◀◀ ▶▶ ▶◀ ▶ ▶◀ ▶◀ 00:02:42 [min:sec.cs] Speed: 1×

Phase Gating



Total kV Dose [mGy] 0.00

Timer [min] 0.0

Reset

HU%:

Anode 5

Housing 0

kV CBCT

Reference CT

<< Previous

Next >>

OK

Cancel

Respiratory Module

Preparation

Treatment

Logged in as a Service User
NOT FOR CLINICAL USE

Service

?

□

×

II

lung ISO 1



SGRT External



ROI1

VRT_{cm}

-0.10



Reference

Treatment

Couch 0.0°

Beam Control



01/12/2022 11:05:00

Gated Capture

LNG_{cm}

0.16



LAT_{cm}

-0.06



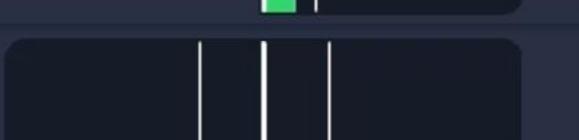
MAG_{cm}

0.20



YAW°

-0.1



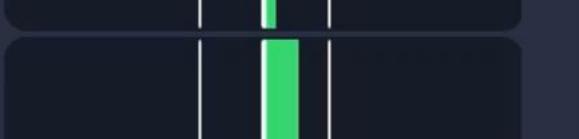
ROLL°

0.5



PITCH°

1.6



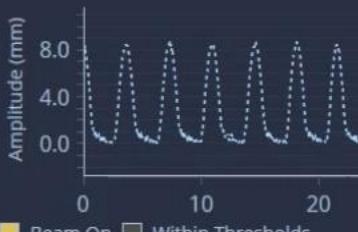
Respiratory Module® Patch Movement
Phase Based

120 BPM

PHASE 91%

Start 30%

Stop 70%



Time (s)

Activate Windows

Go to Settings to activate Windows.

Surface

Deformation

Video

Patch



Respiratory Module

visionrt

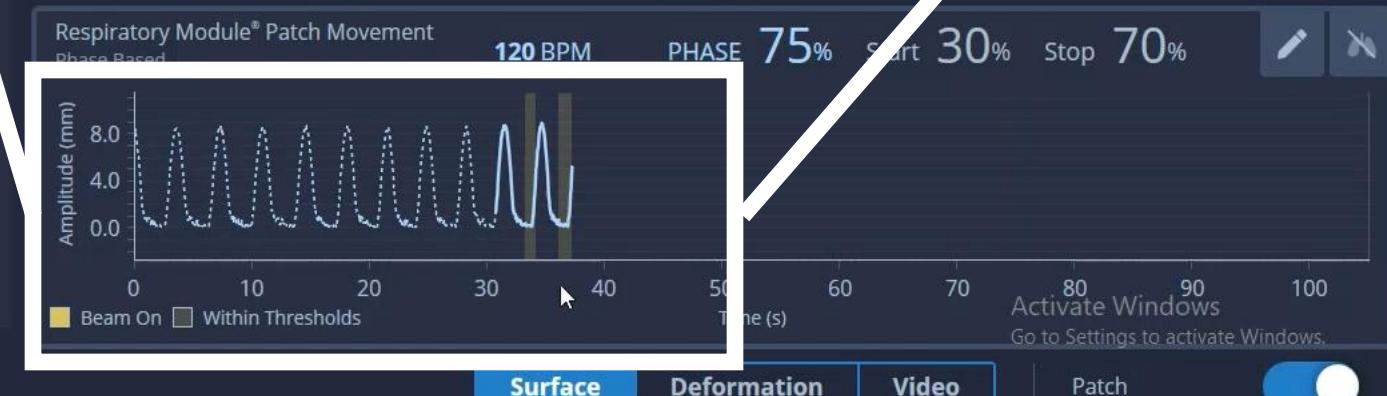
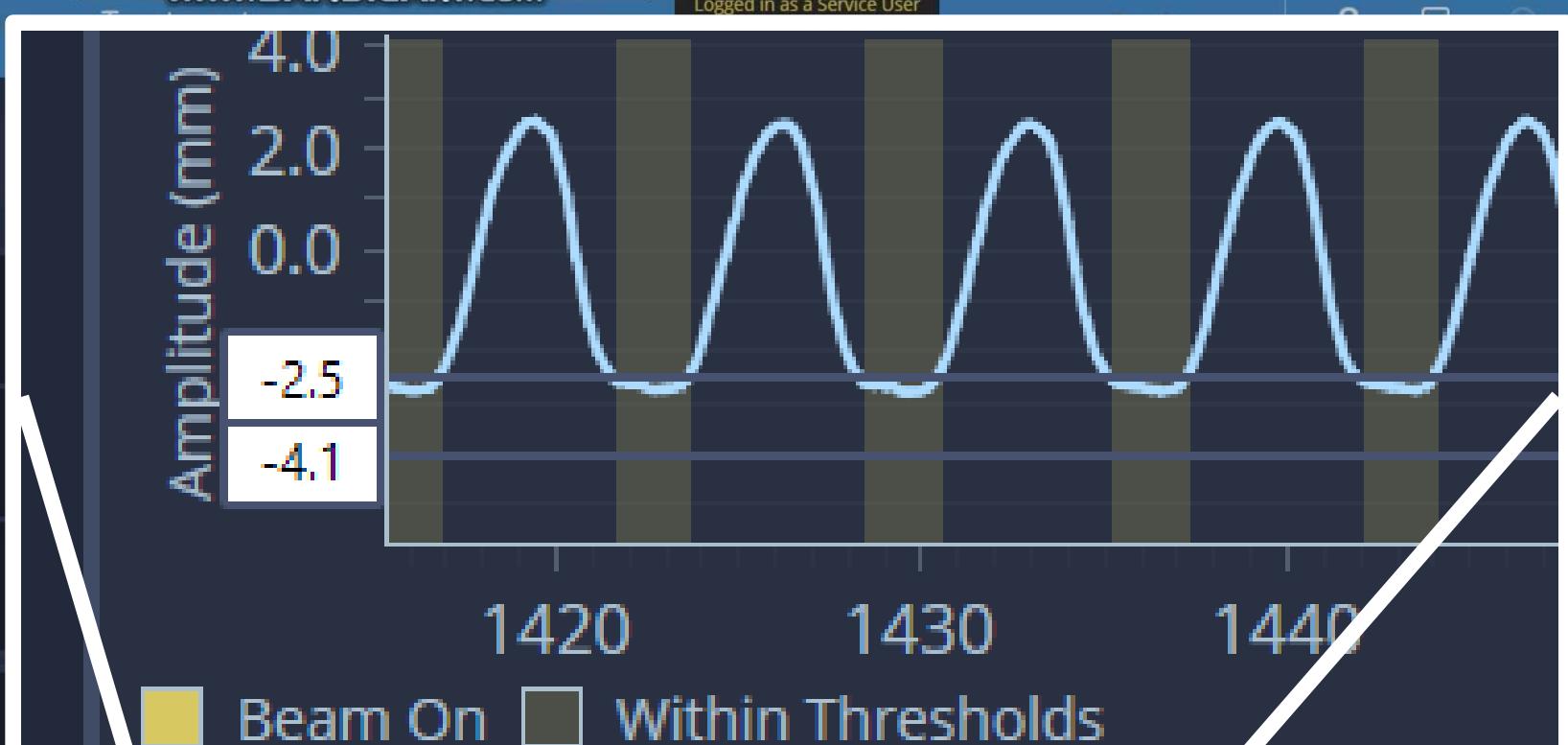
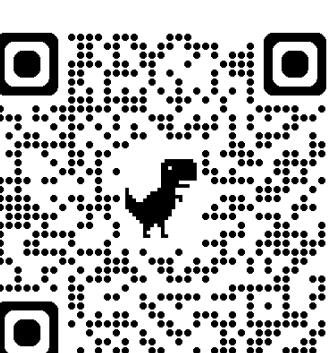
VRX cm 0.01

LNG cm 0.02

LAT cm -0.02

MAG cm 0.04

YAW ° -0.1



Respiratory Module

SIM PLAN TREAT DOSE

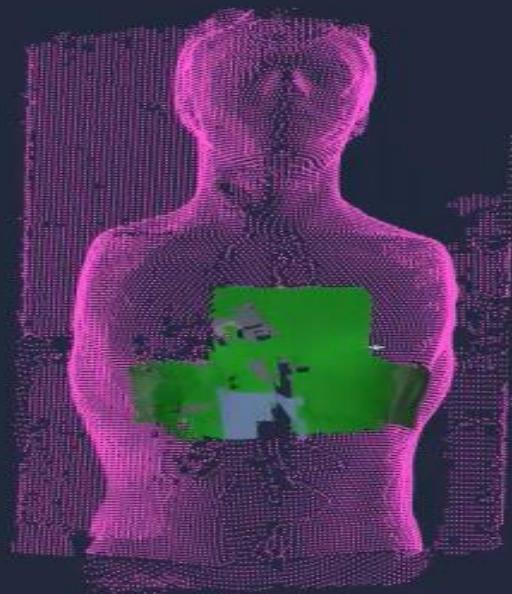
Gated Capture



ROI1

Touch 0.0°

Beam Control



Respiratory Module® Patch Movement
Amplitude Based

120 BPM

PHASE 88%



Beam On Within Thresholds

Time (s)

Activate Windows
Go to Settings to activate Windows.

Surface

Deformation

Video

Patch

Considerations

- SGRT does not interlock the CBCT on Truebeam
- SGRT is not compatible with 4D CBCT on Truebeam
- Relearn the trace each day
- Patch position variability.
- Camera visibility

What's Next?

- Starting imaging using 4D CBCT
- Begin exploring further uses of the abnormal breathing function
- Begin phase-based gating using Respiratory Module

ANY
questions?

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