

0 ^
v
Gantry Angle(°)
0 ^
v



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MapRT – Current use and Future Development

Glen Osbourne

Clinical Lead RT – Peter MacCallum Cancer Centre

Moorabbin Campus

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What is MapRT

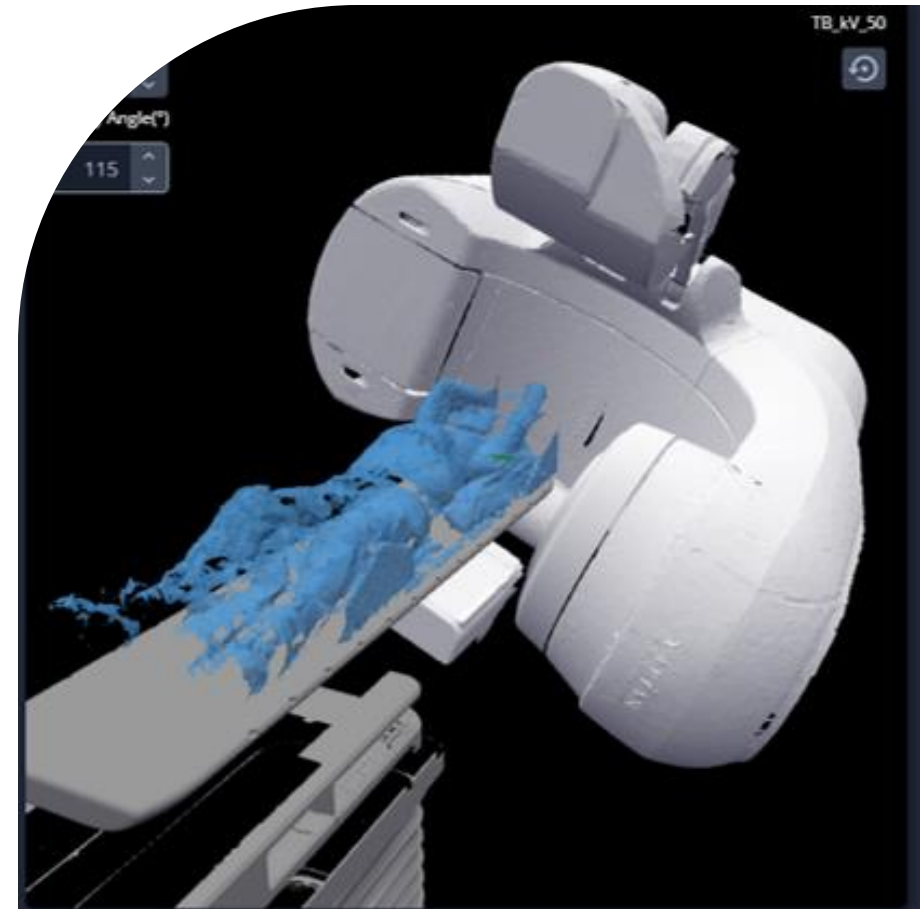
Current Usage

- Breast
- Sarcoma
- H&N

Current Projects

- Non Coplanar projects
- MapRT API

Conclusion



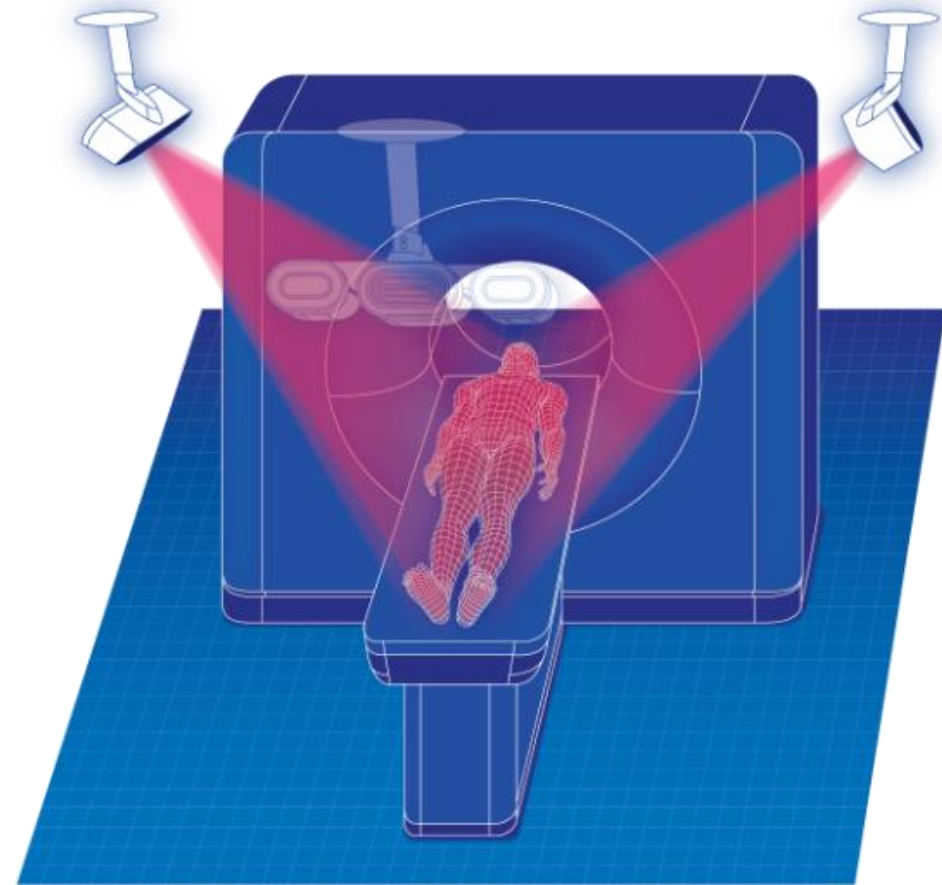
What is MapRT?



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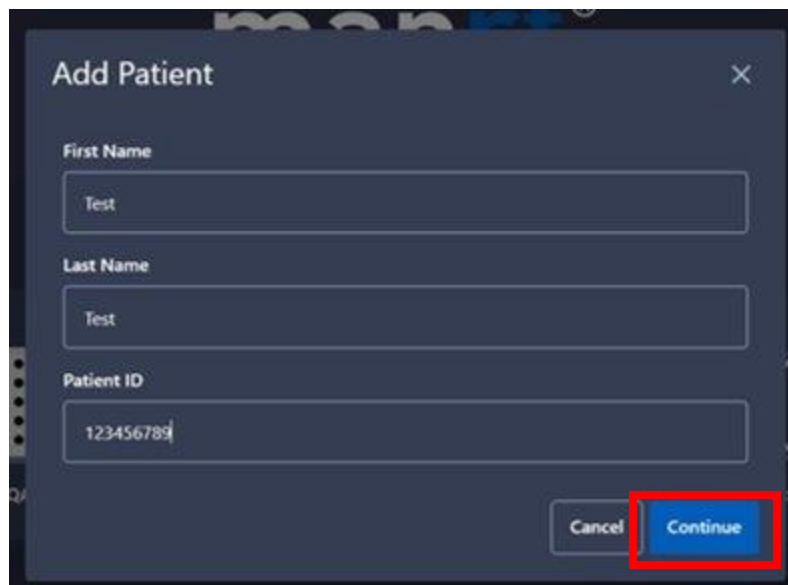
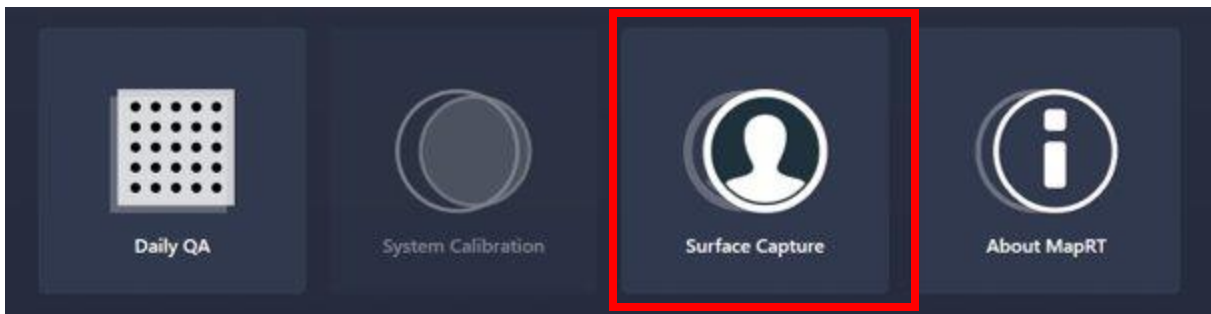
What is MapRT?

- Two Horizon Full field of view cameras
- Two dedicated MapRT computers
- Captures 3D surface of entire patient and accessories
- View clearance map in online browser
- Interactive interface (Isocentre, linac, imaging arms, couch)

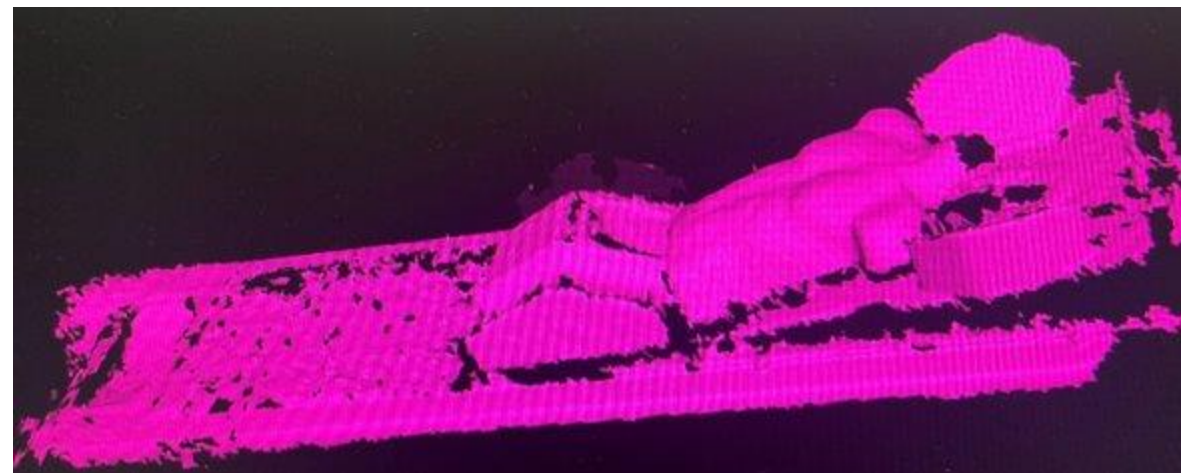


MapRT image courtesy of Vision RT

MapRT Interface at CT



The image shows a dialog box titled 'Add Patient' with a close button (X) in the top right corner. It contains three text input fields: 'First Name' with 'Test', 'Last Name' with 'Test', and 'Patient ID' with '123456789'. At the bottom right, there are two buttons: 'Cancel' and 'Continue' (highlighted with a red border).



MapRT Interface – Clearance Review



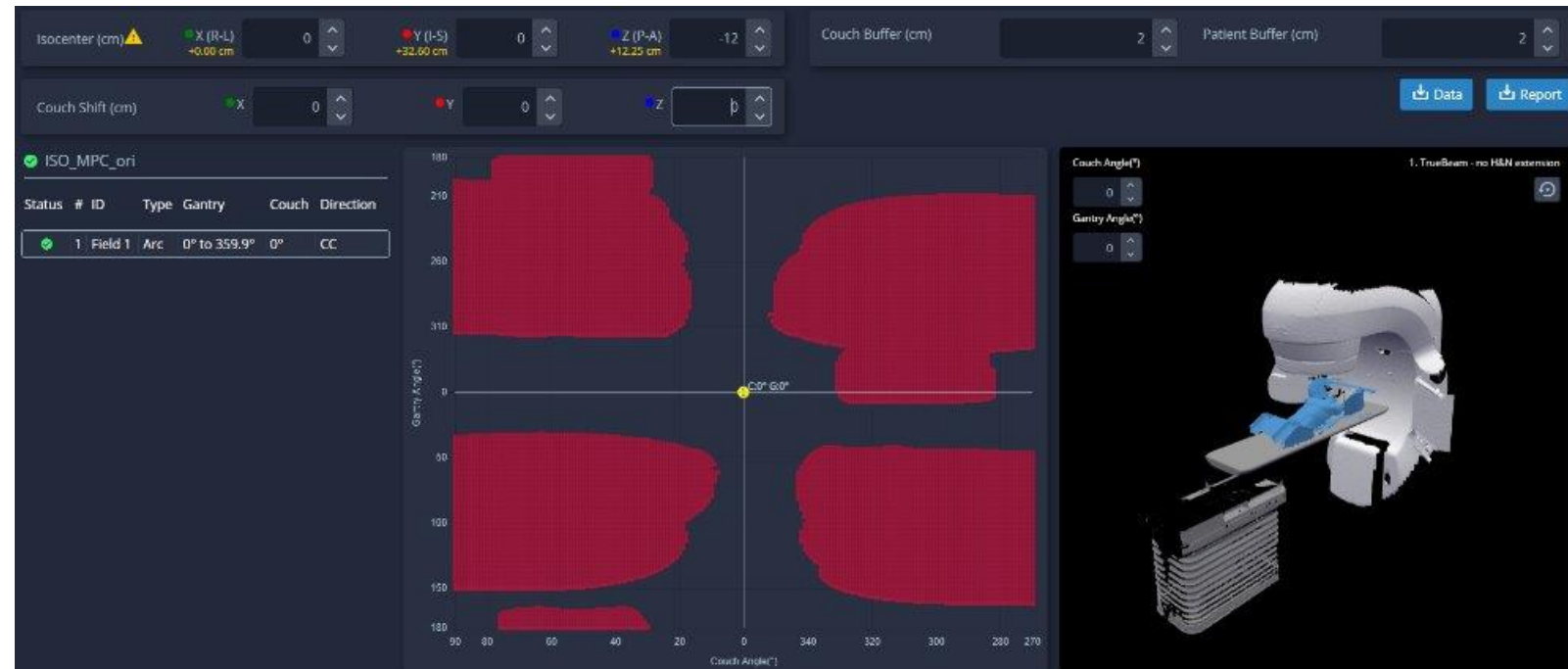
The screenshot displays the MapRT interface with several key components highlighted by red boxes and white labels:

- DICOM and Isocentre Co-ordinates:** A control panel at the top left showing Isocenter (cm) and Couch Shift (cm) with X (R-L), Y (I-S), and Z (P-A) axes. Values for X, Y, and Z are 0, 0, and -12 respectively.
- Adjustable Buffers:** A control panel at the top right for Couch Buffer (cm) and Patient Buffer (cm), both set to 2.
- Beam Geometry:** A table on the left side of the interface showing treatment field details.
- Clearance Map:** A central visualization area showing a 3D model of the patient and the linear accelerator gantry, with red shaded regions indicating clearance areas. The axes are Gantry Angle (°) and Couch Angle (°).
- Interactive Model:** A 3D model of the linear accelerator gantry and patient table, with controls for Couch Angle (°) and Gantry Angle (°).

Status	#	ID	Type	Gantry	Couch	Direction
✓	1	Field 1	Arc	0° to 359.9°	0°	CC

Current Usage

- MapRT available on 1 CT scanner
- Every patient on this CT has a surface capture
- Clearance Map encouraged for all arms up patients
- Clearance Maps available as required
- Allows future development



Current Usage

	CT Scans	MapRT Captures	Clearance Mapping
December 2025	123	112 (91%)	52 (46%)
January 2026	121	99 (82%)	47 (47%)
February 2026	98	82 (84%)	38 (46%)
TOTALS	342	293 (86%)	137 (47%)

Summary

86% of patients have a MapRT capture at CT (exceptions H&N/patient rescans/palliative)

47% of those patients have a Clearance Map completed in Map RT (mainly consists of Breast and Lung)

Common Use Cases

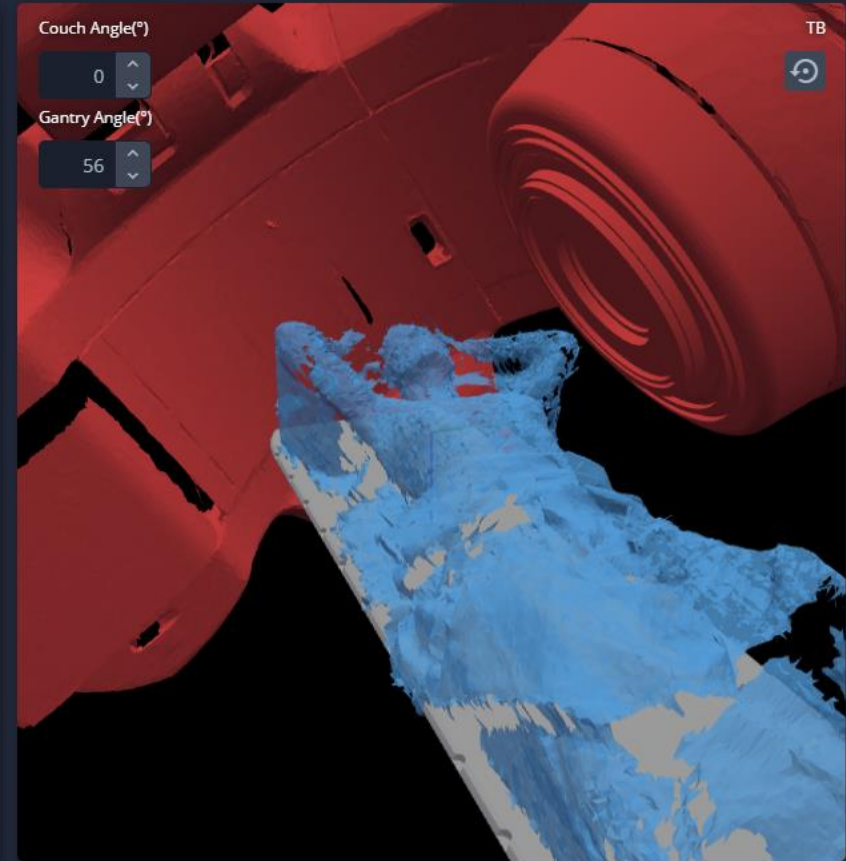
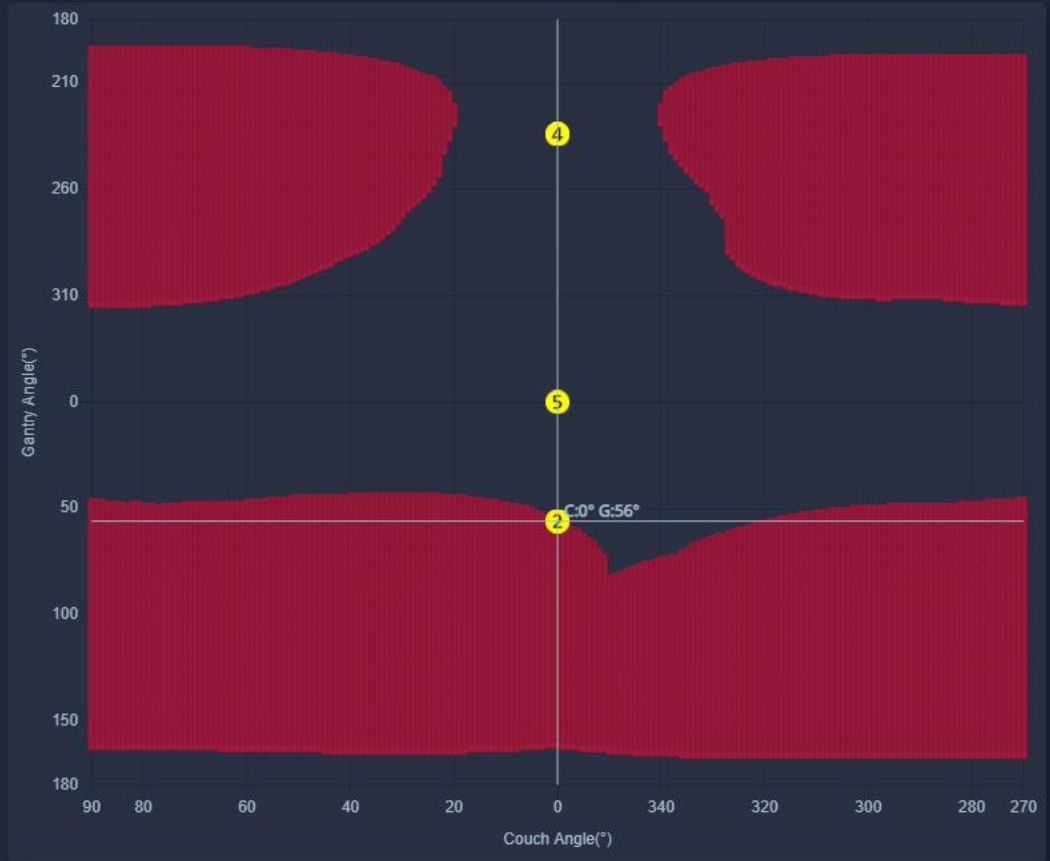


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Breast Planning

RtBrstSIB UFT

Status	#	ID	Type	Gantry	Couch	Direction	
✖	1	01	Static	56°	0°	--	☑
✖	2	02	Static	56°	0°	--	☑
☑	3	03	Static	234°	0°	--	☑
☑	4	04	Static	234°	0°	--	☑
☑	5	05	Static	0°	0°	--	☑

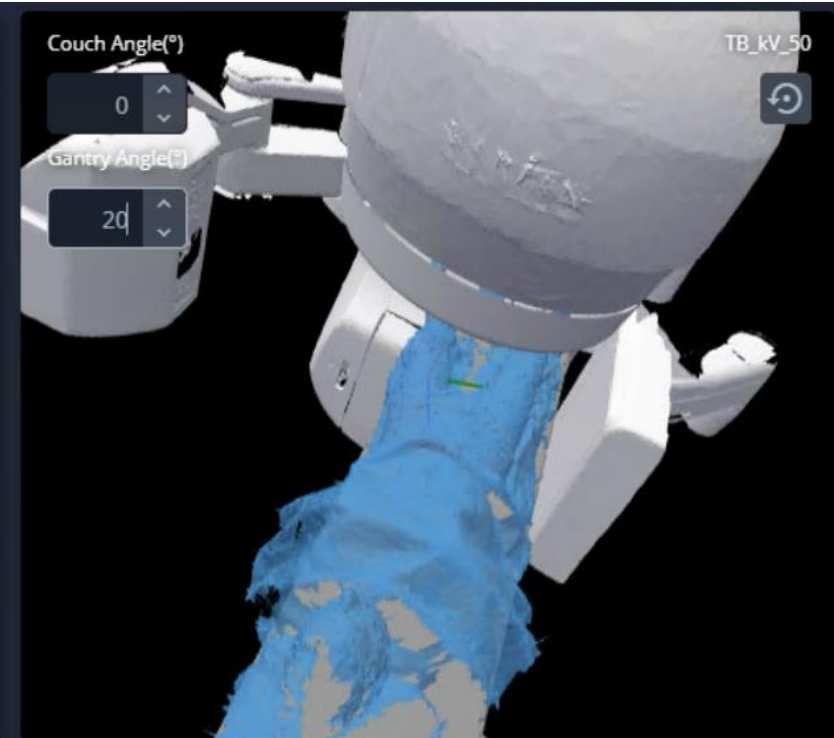
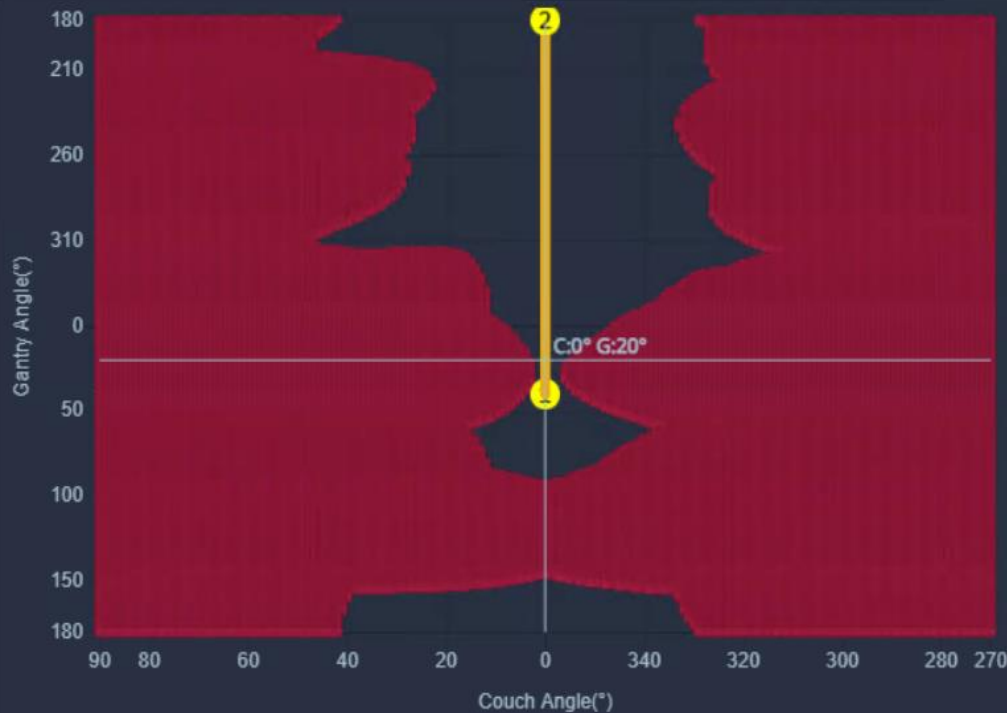


Sarcoma L Thigh - CBCT Clearance

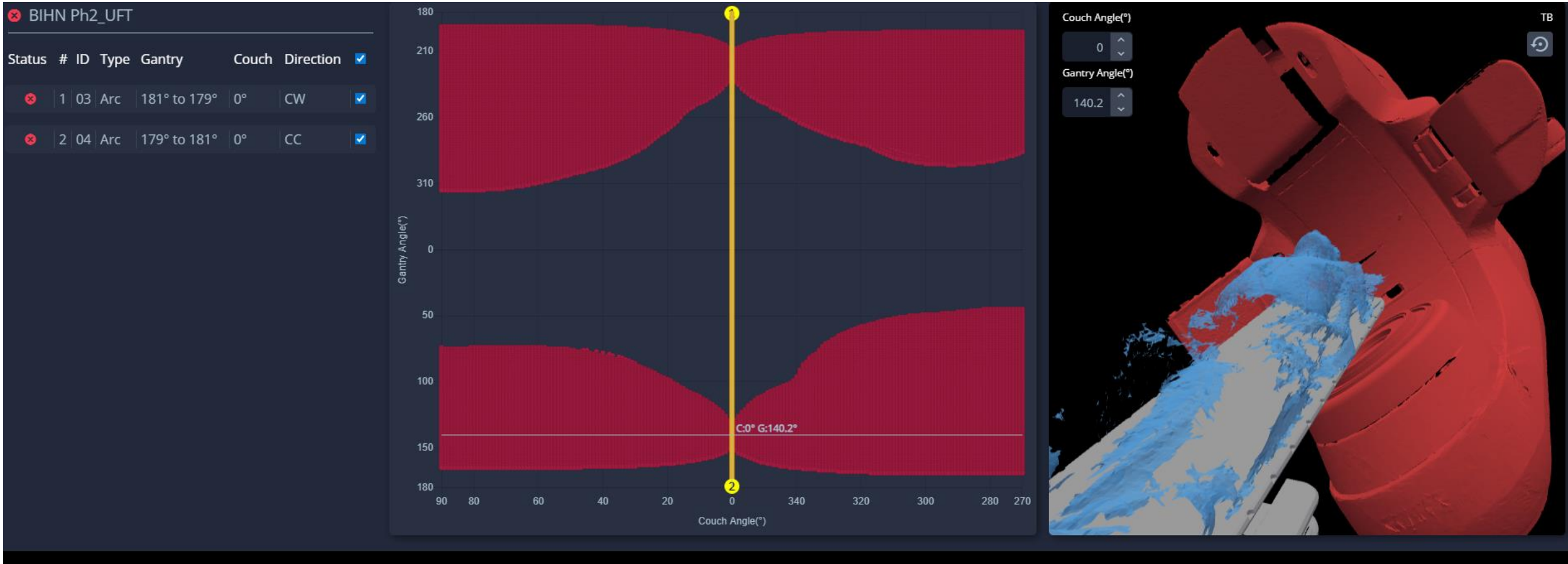
✔ Lt Thigh UFT

Status # ID Type Gantry Couch Direction

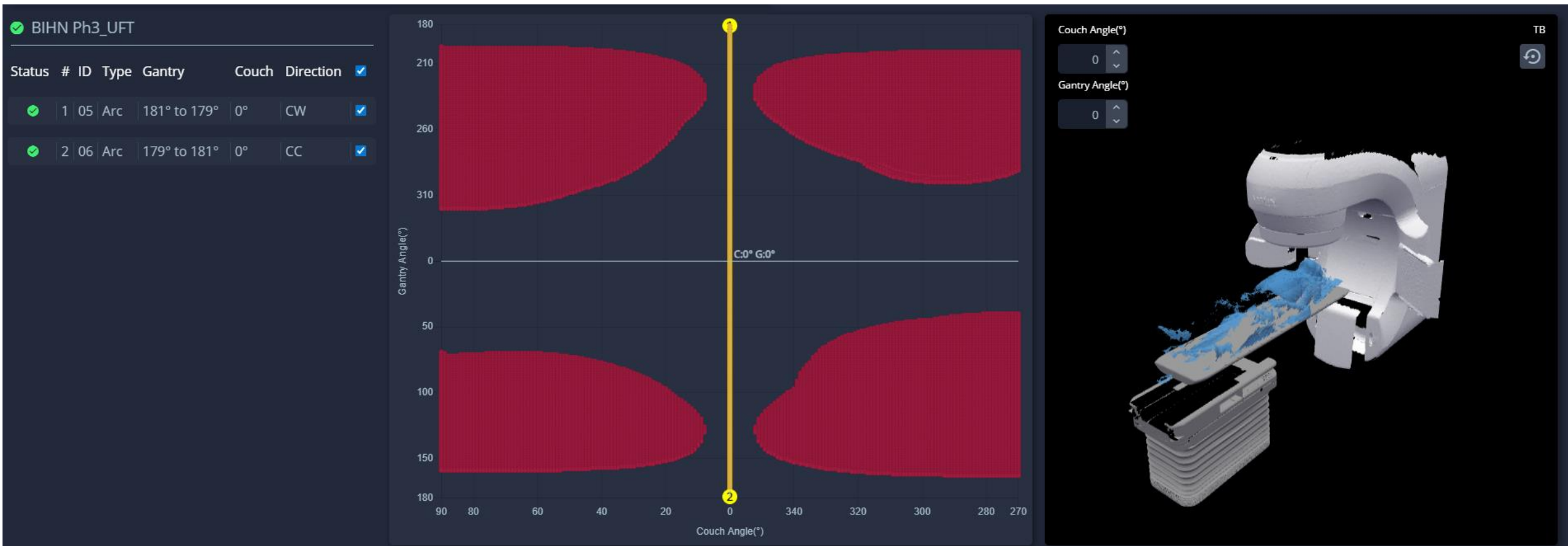
Status	#	ID	Type	Gantry	Couch	Direction
✔	1	01	Arc	40° to 180.1°	0°	CC
✔	2	02	Arc	180.1° to 40°	0°	CW



H&N Collision Replanned



H&N Collision Replanned



Current Projects

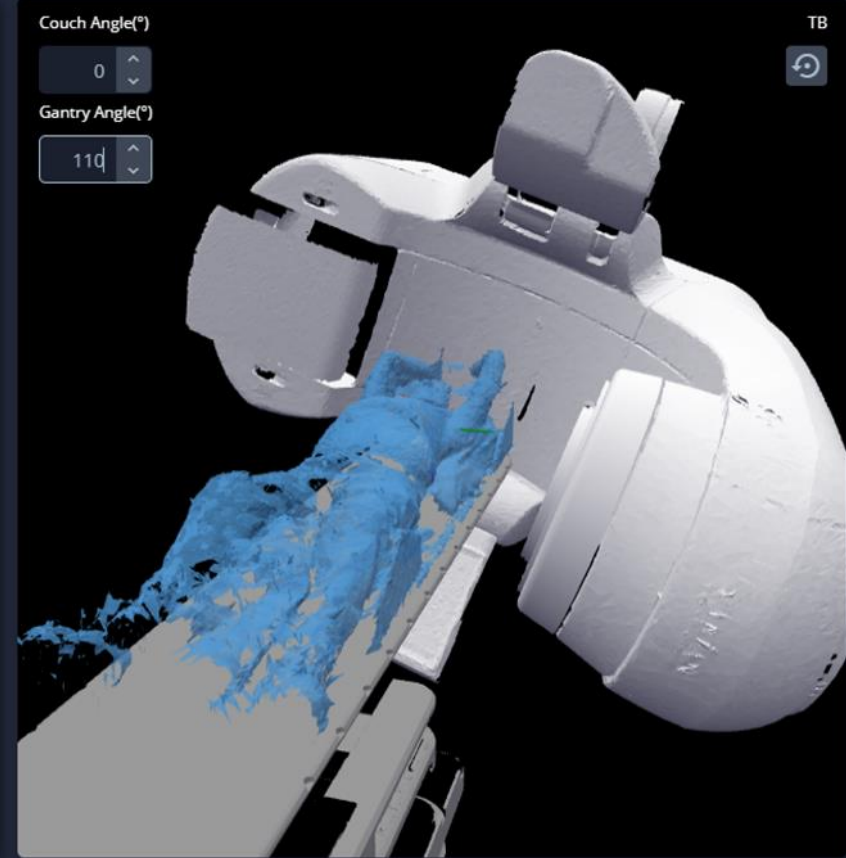
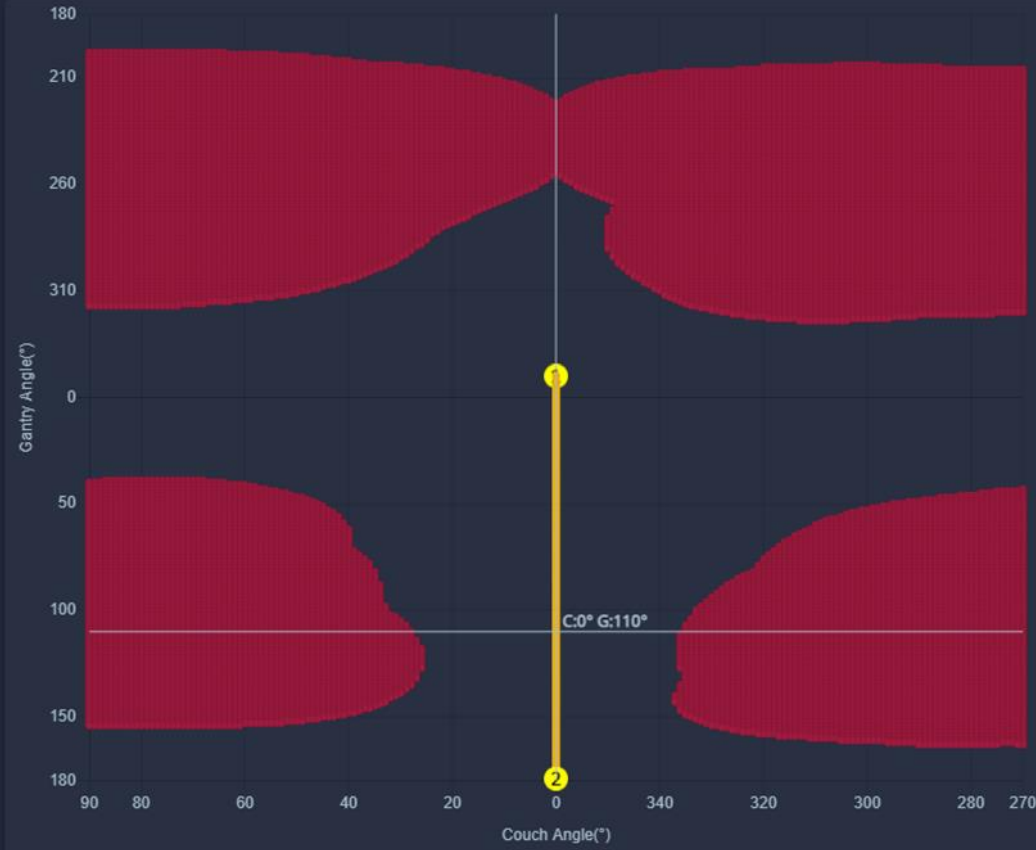


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Lung SABR – non coplanar planning

✓ L Lung UFT

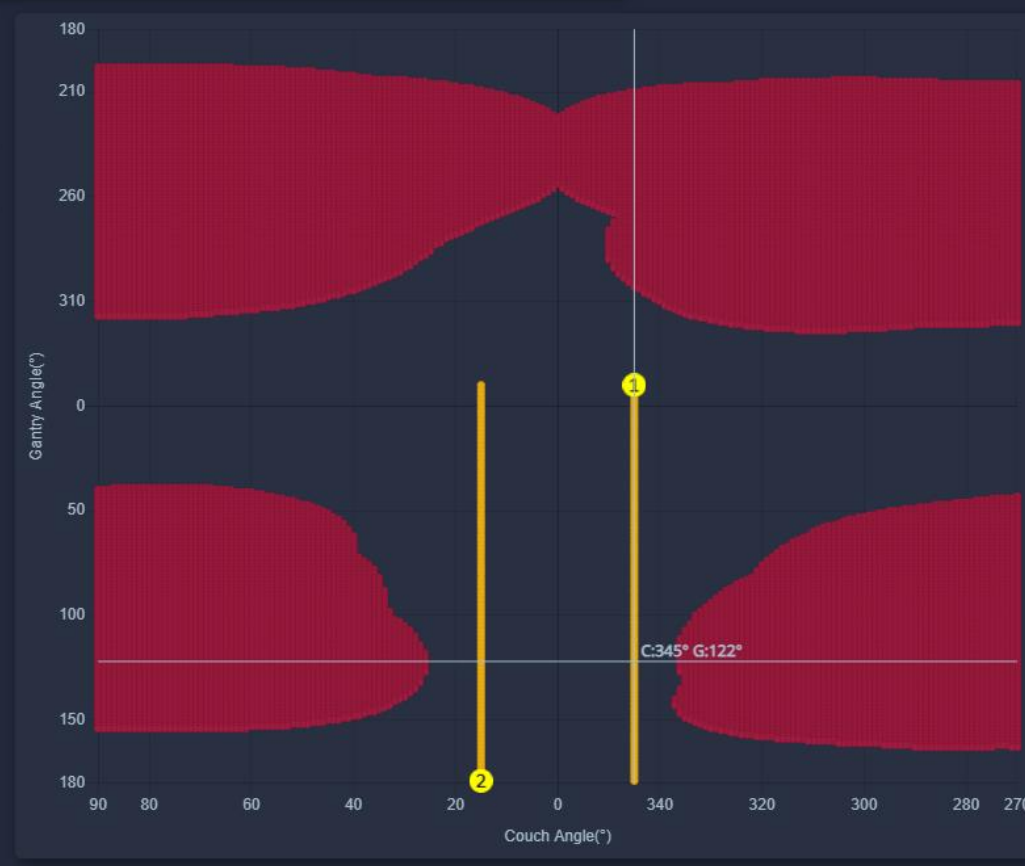
Status	#	ID	Type	Gantry	Couch	Direction	✓
✓	1	01	Arc	350° to 179°	0°	CW	✓
✓	2	02	Arc	179° to 350°	0°	CC	✓



Lung SABR – non coplanar planning

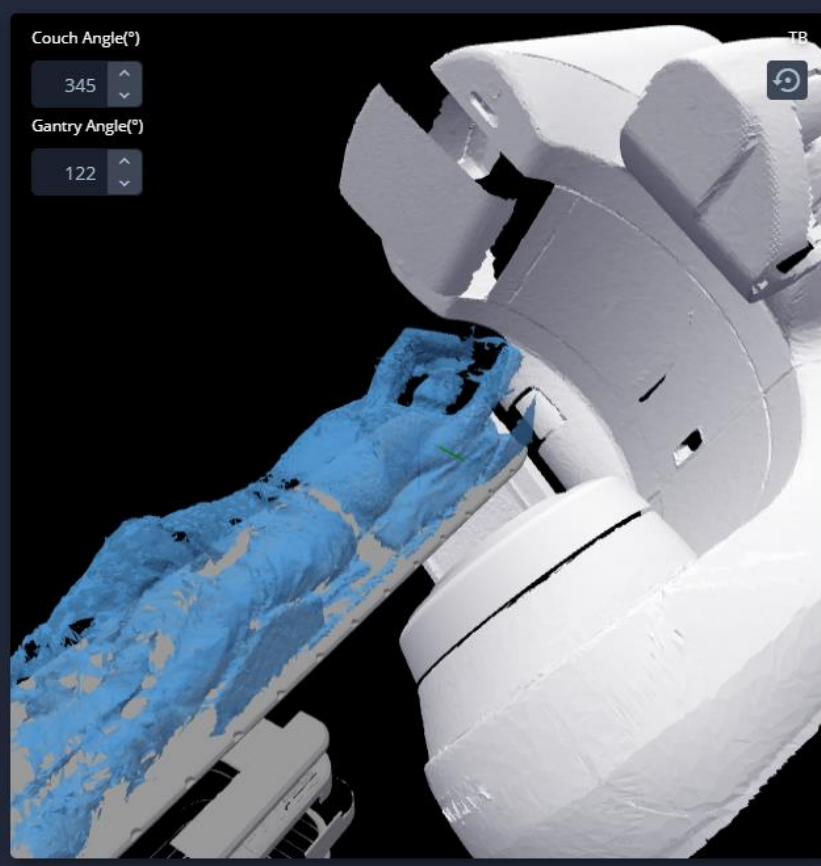
✓ L Lung goo

Status	#	ID	Type	Gantry	Couch	Direction	
✓	1	01	Arc	350° to 179°	345°	CW	✓
✓	2	02	Arc	179° to 350°	15°	CC	✓

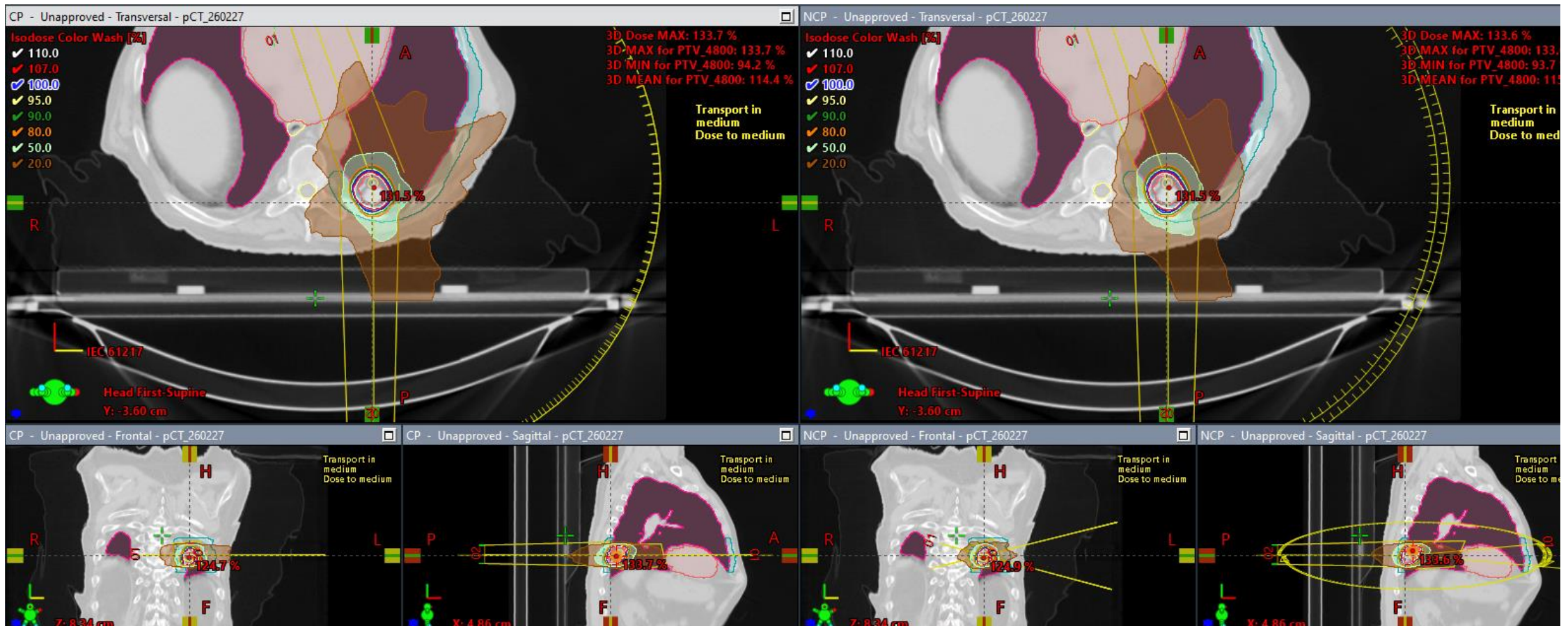


Couch Angle(°)
345

Gantry Angle(°)
122



Lung SABR – non coplanar planning



Lung SABR – non coplanar planning

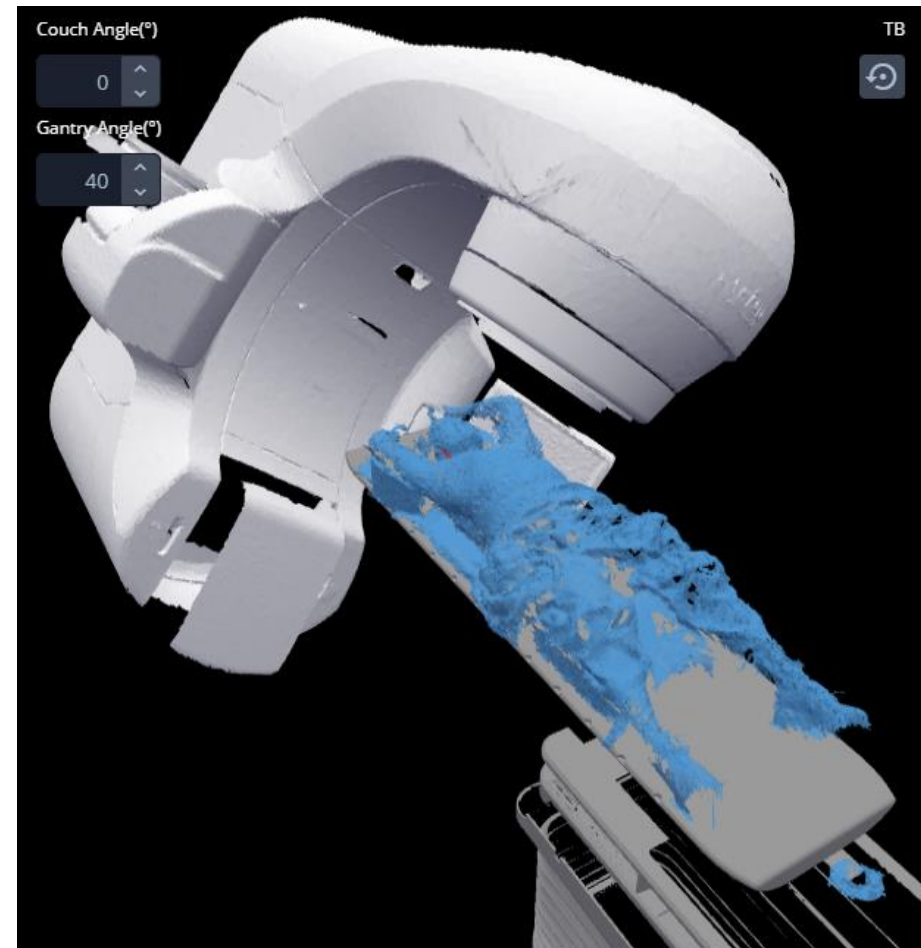
Clinical goals: All Plans Evaluate Goals for All Plans

Plan			■ NCP			▲ CP		
Total Dose			48.000 Gy			48.000 Gy		
Clinical Goal Summary			0	0	12	0	0	12
● iGTV_4800	P2	Dmean > 120.0 %	124.10 %			123.20 %		
● PTV_4800	P2	D 95.0 % > 100.0 %	103.19 %			102.84 %		
	P2	D 99.0 % > 100.0 %	100.40 %			100.40 %		
	P2	Conformity Index < 1.20	1.06			1.05		
	P3	D 2.0 % < 135.0 %	130.41 %			129.83 %		
	P3	D 2.0 % > 125.0 %	130.41 %			129.83 %		
● Chestwall	P1	V 30.00 Gy < 30.00 cm ³	15.514 cm ³			15.895 cm ³		
● Esophagus	P1	D 0.03 cm ³ < 30.00 Gy	5.13 Gy			6.48 Gy		
● Heart	P1	D 0.03 cm ³ < 34.00 Gy	12.79 Gy			12.93 Gy		
	P1	V 28.00 Gy < 15.00 cm ³	0.000 cm ³			0.000 cm ³		
● Lungs	P2	V 5.00 Gy < 66.0 %	11.25 %			12.52 %		
● Skin	P1	D 0.03 cm ³ < 36.00 Gy	22.76 Gy			23.98 Gy		

CI 50
NCP 3.8
CP 4.0

Images Courtesy of Roxanne Hendricks

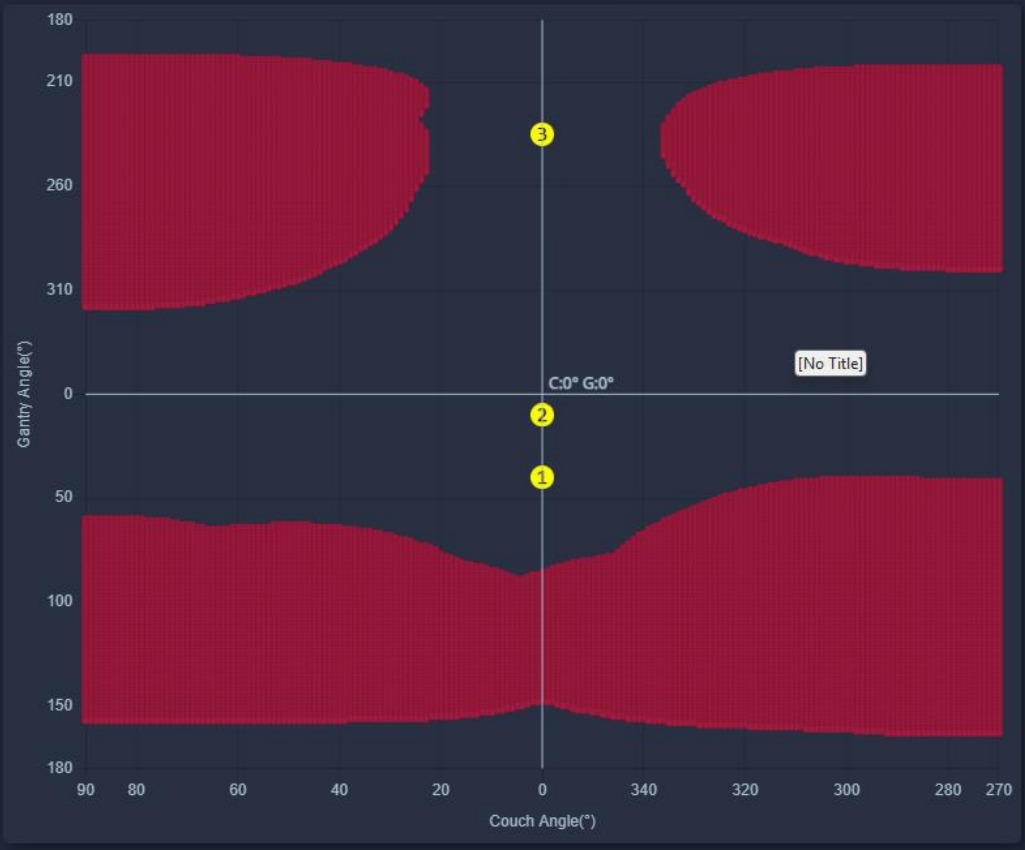
Partial Breast – Arm Up vs Arm Down



Partial Breast – non coplanar planning

✓ R PAR BR

Status	#	ID	Type	Gantry	Couch	Direction	✓
✓	1	01	Static	40°	0°	--	✓
✓	2	02	Static	10°	0°	--	✓
✓	3	03	Static	235°	0°	--	✓



Gantry Angle(°)


Couch Angle(°)

C:0° G:0°

[No Title]

Couch Angle(°) 0

Gantry Angle(°) 0

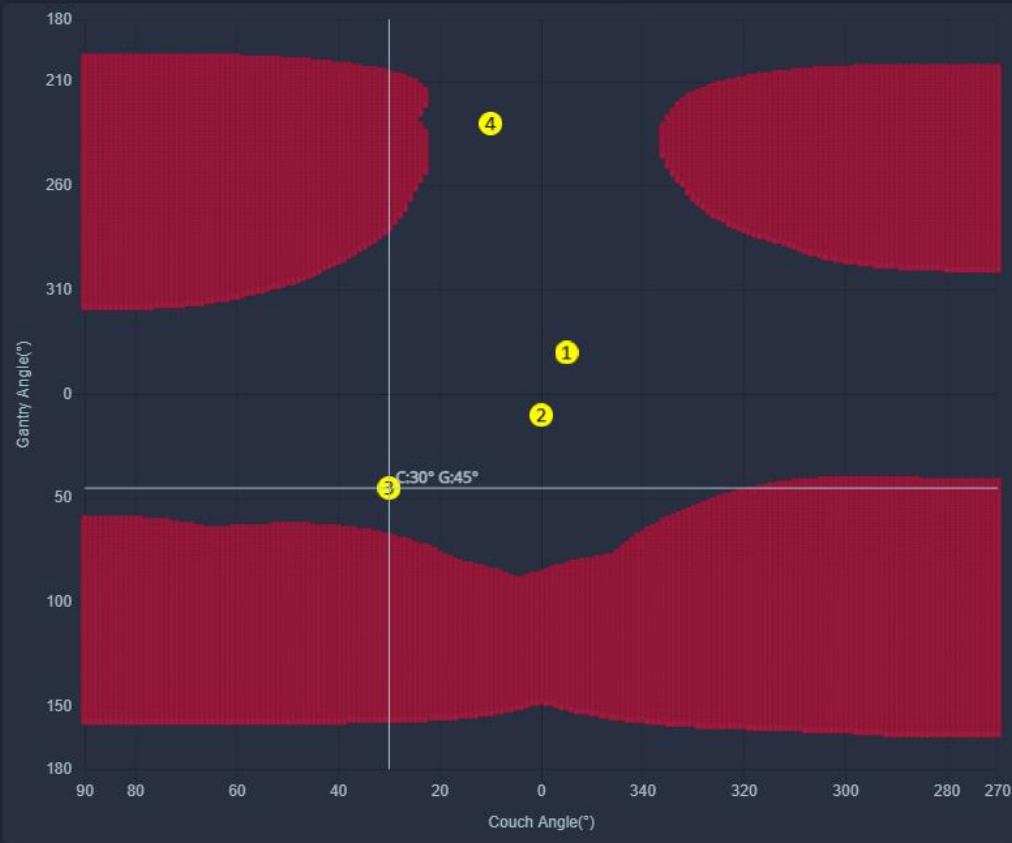


TB

Partial Breast – non coplanar planning

✓ R Par Br NC

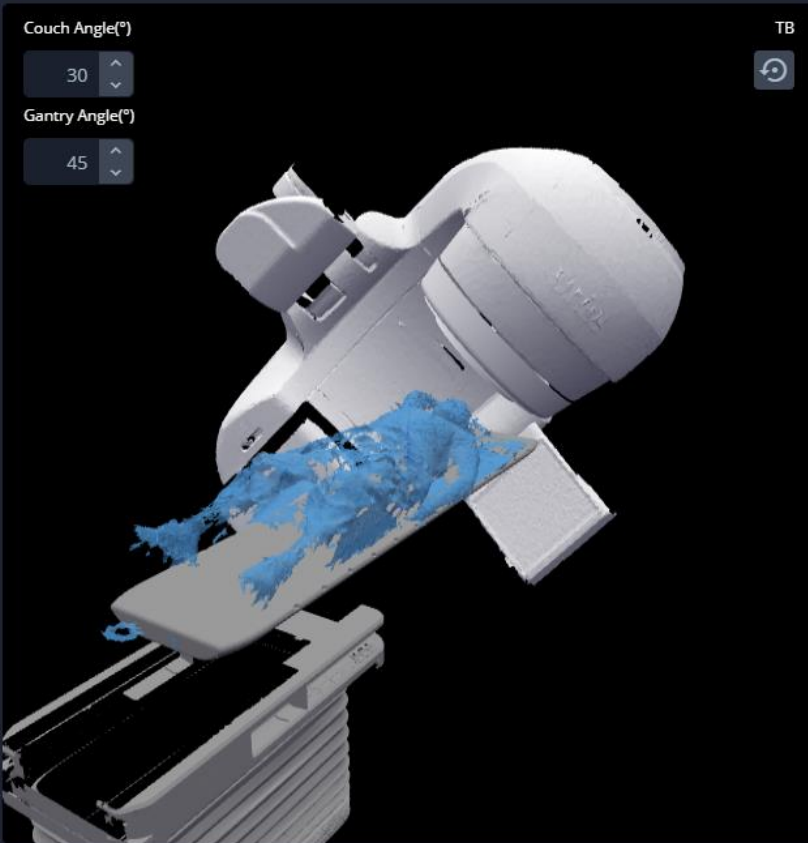
Status	#	ID	Type	Gantry	Couch	Direction	
✓	1	01	Static	340°	355°	--	✓
✓	2	02	Static	10°	0°	--	✓
✓	3	03	Static	45°	30°	--	✓
✓	4	04	Static	230°	10°	--	✓



A plot showing Gantry Angle (°) on the y-axis (180 to 180) and Couch Angle (°) on the x-axis (90 to 270). Red shaded regions represent target areas. A vertical line is drawn at Couch Angle = 30°. A point is labeled 'C:30° G:45°'. Yellow circles 1, 2, 3, and 4 mark specific points on the plot.

Couch Angle(°)
30

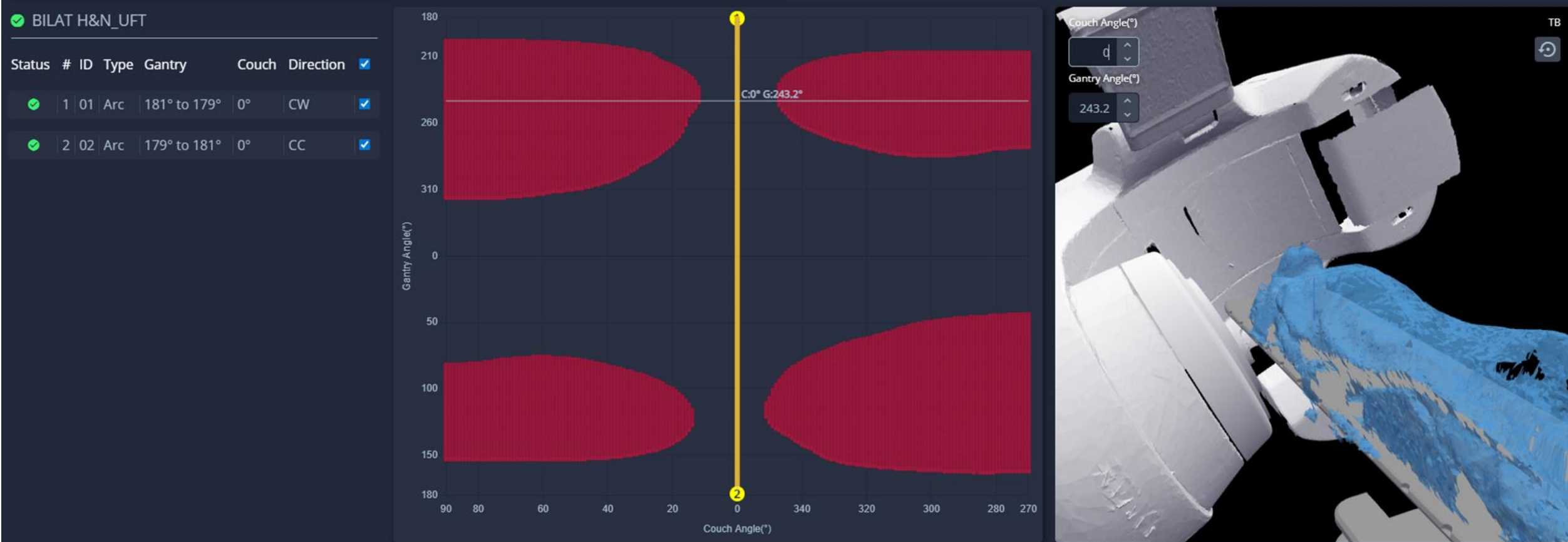
Gantry Angle(°)
45



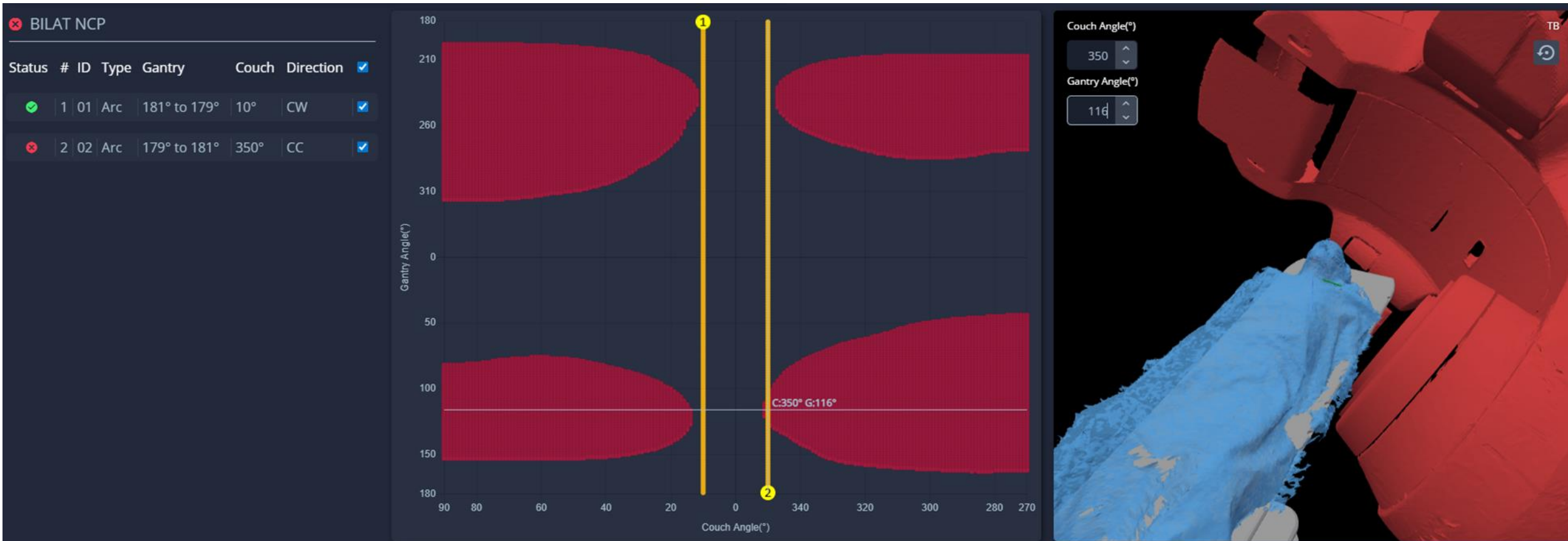
3D model of a linear accelerator (linac) with a blue target volume overlaid on the patient couch. The linac is tilted at a gantry angle of 45 degrees. The couch is tilted at a couch angle of 30 degrees. The target volume is shown in blue.

TB

Bilat H&N– non coplanar planning



Bilat H&N– non coplanar planning



MapRT API



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MapRT API – Plan Checker Script

MapRT Check



MapRT indicates **all fields have sufficient clearance**



Additional information 

MapRT Check



Surface timestamp: 23/09/2025 2:24:27 PM



Couch buffer: 2 cm



Patient buffer: 2 cm



Field '01' checked against room 'TB': **Passes**



Field '02' checked against room 'TB': **Passes**



Field 'AA' checked against room 'TB_kV_50': **Passes**



Field 'BB' checked against room 'TB_kV_50': **Passes**



Field 'CC' checked against room 'TB_kV_50': **Passes**

MapRT API – Future Development

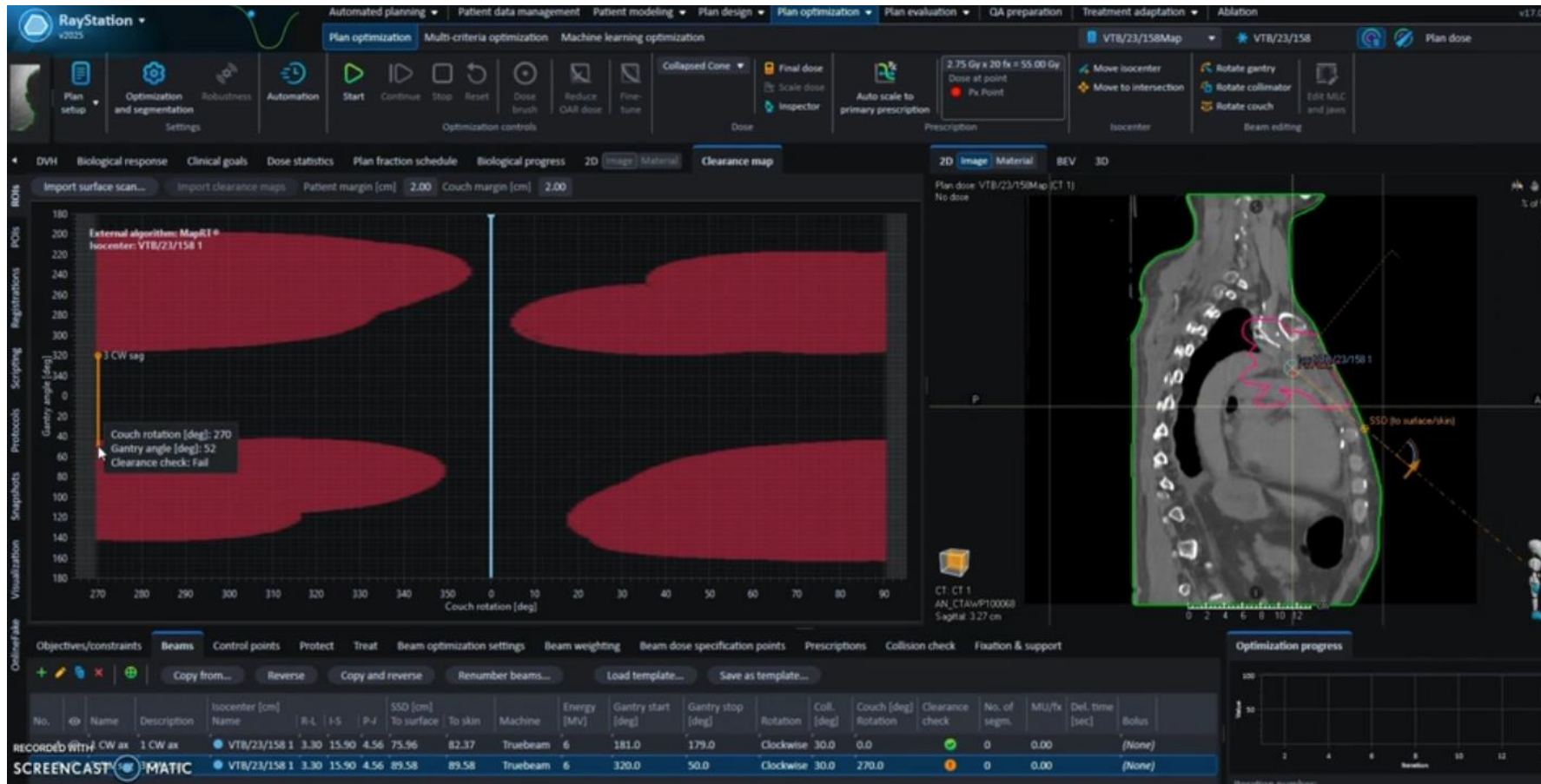
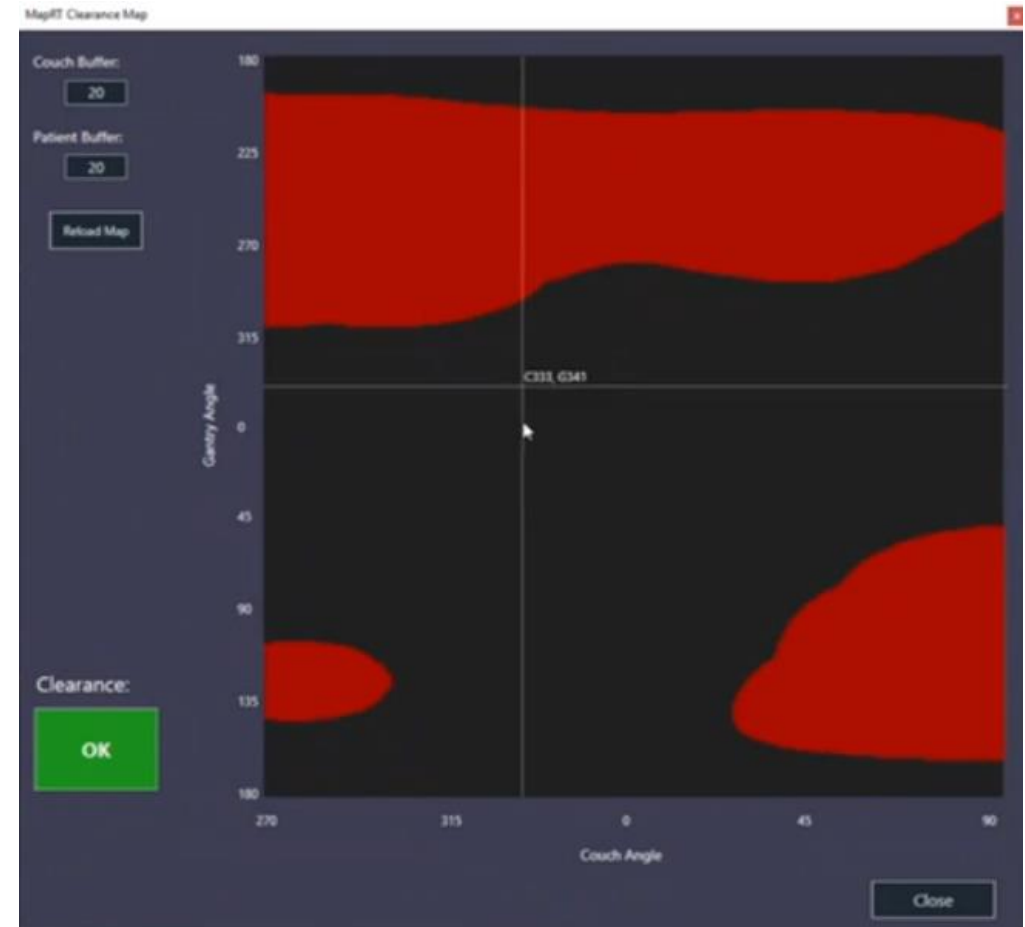
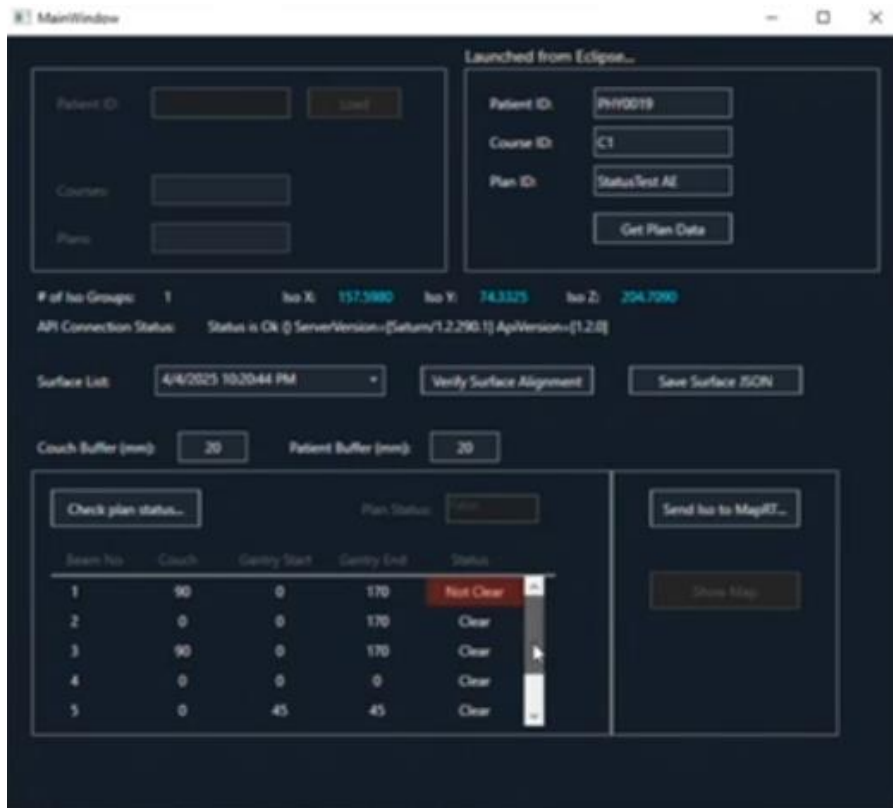


Image Courtesy of VisionRT website

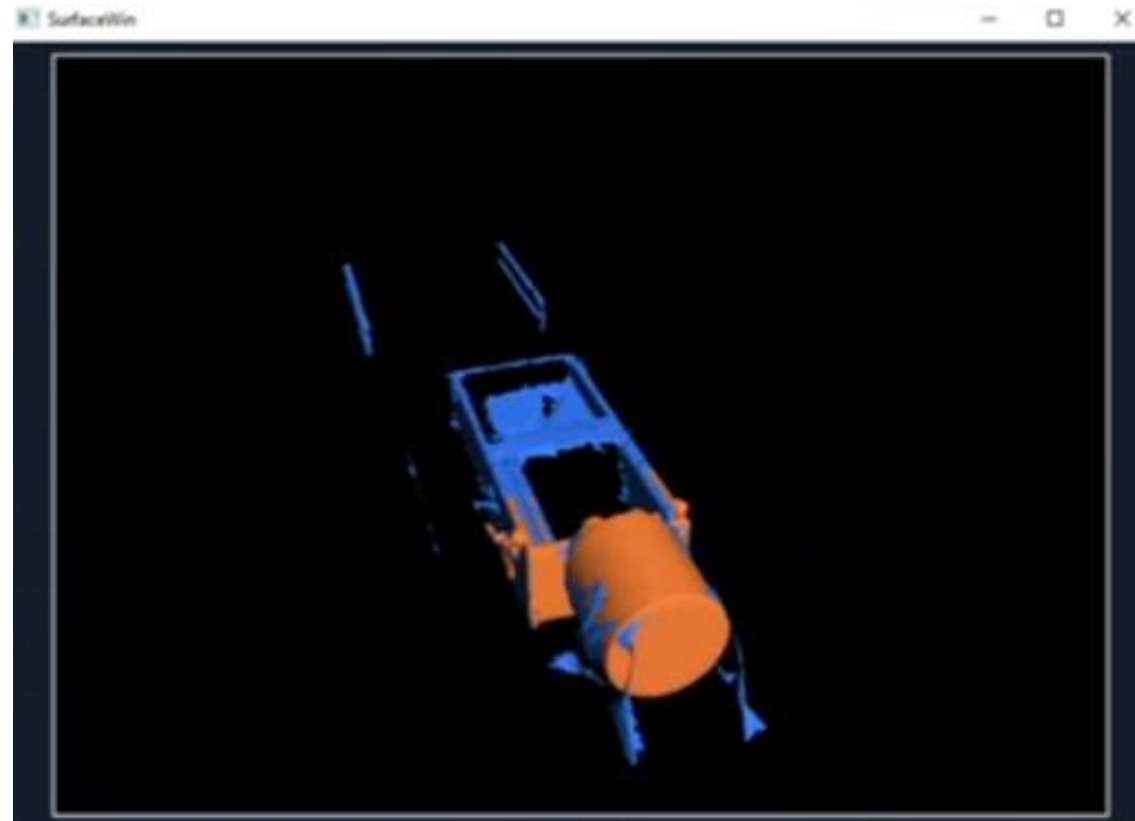
MapRT API – Future Development



Images Courtesy of VisionRT website
Anton Eagle & Mike Tallhamer, AdventHealth Colorado

MapRT API – Future Development

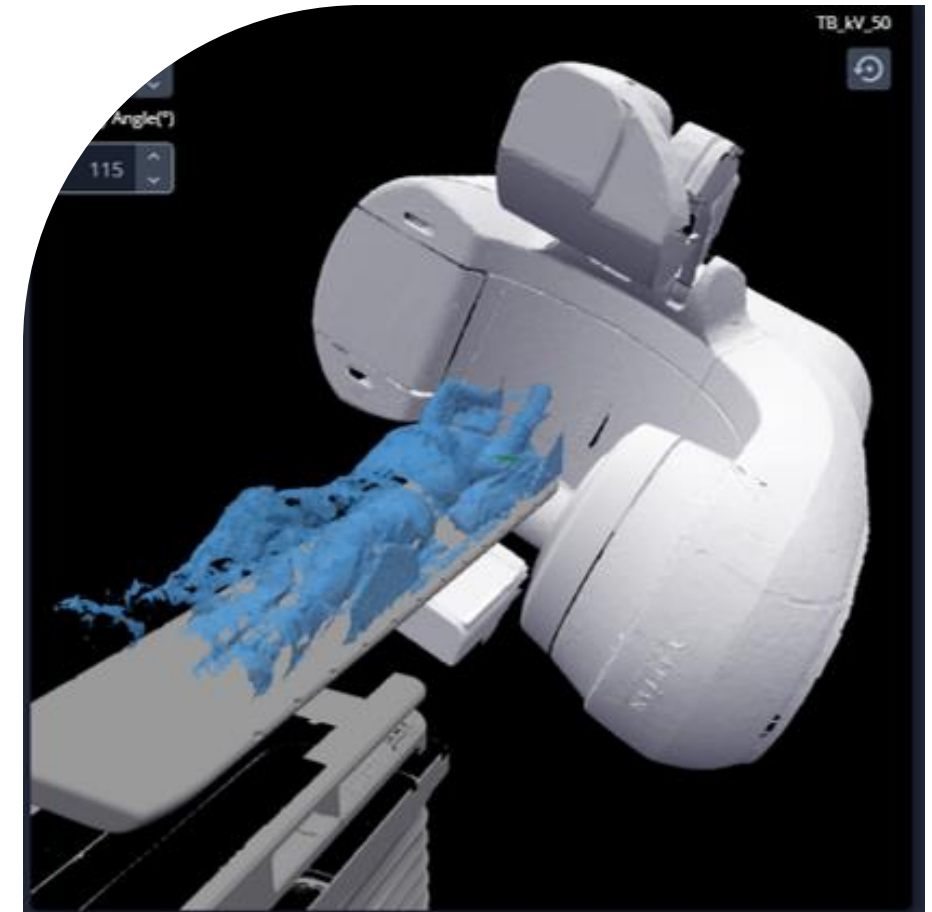
- Does the MapRT surface match the CT scan?
- Can the MapRT surface be available at Treatment?



Images Courtesy of VisionRT website
Anton Eagle & Mike Tallhamer, AdventHealth Colorado

Conclusion

- Successfully implemented in our department
- Improved confidence in clearance mapping checks and optimisation of isocentre positions
- Current and future work is focusing on more efficiently integrating MapRT into our workflows, and assessing the benefits of increasing non-coplanar treatments



Thank you



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