EXPERIENCE WITH ENSITE X EP SYSTEM

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II. ČESKÝ SJEZD KARDIOLOGICKÝCH TECHNIKŮ VE SPOLUPRÁCI S KARDIO 35

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Milovy

NEMOCNICE ČESKÉ BUDĚJOVICE, a.s.

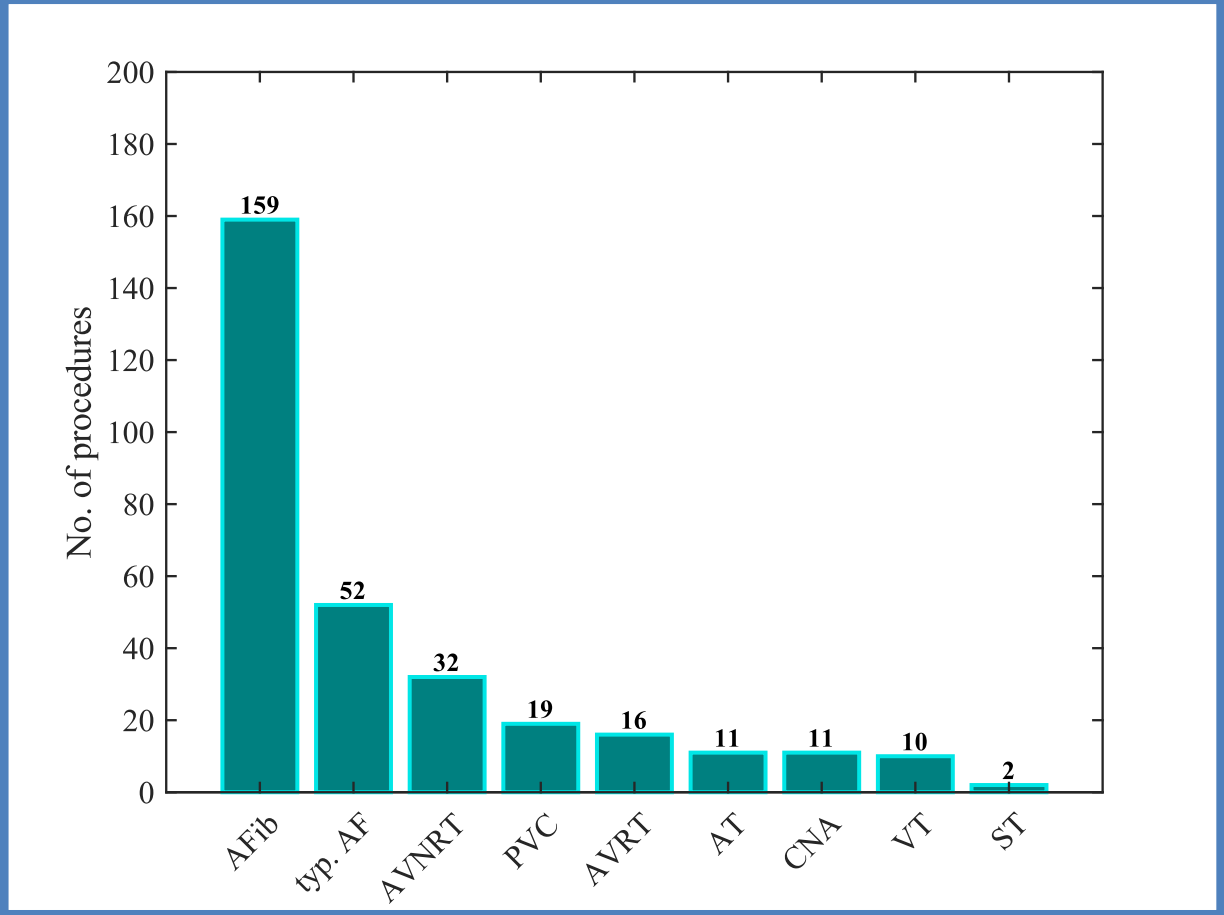
ČESKÁ KARDIOLOGICKÁ SPOLEČNOST

EP LAB - History

2008	2010	8/2010	10/2010	3/2012	2017	2019	2022	2030
First RFA's CARTO XP	CARTO 3	Ensite Velocity Hansen	Pentaray	SmartTouch	Ensite Precision SW	Ensite Precision HW	**Ensite X**	**?**

ENSITE X EP SYSTEM - Procedures

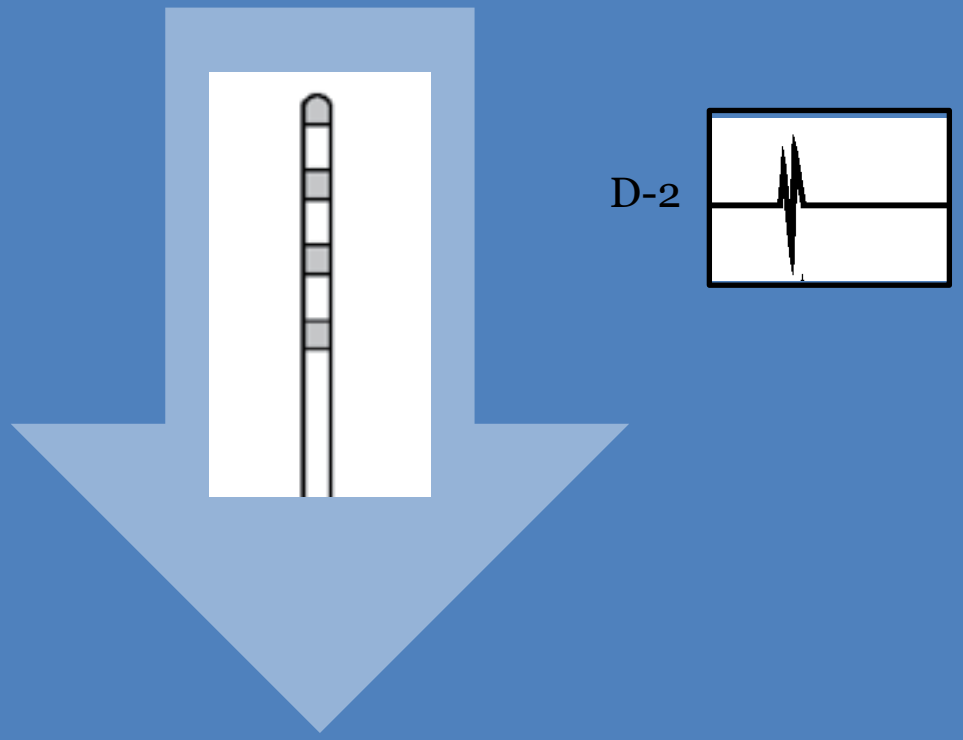
- First procedure January 10 2022 – **PVC**
- Until the end of 2022 in total **331** procedures
  - **223** procedures in **Voxel** mode (AFib, CNA, AT, PVC, VT)
  - **108** procedures in **NavX** mode (AVNRT, AVRT, typ. AF)



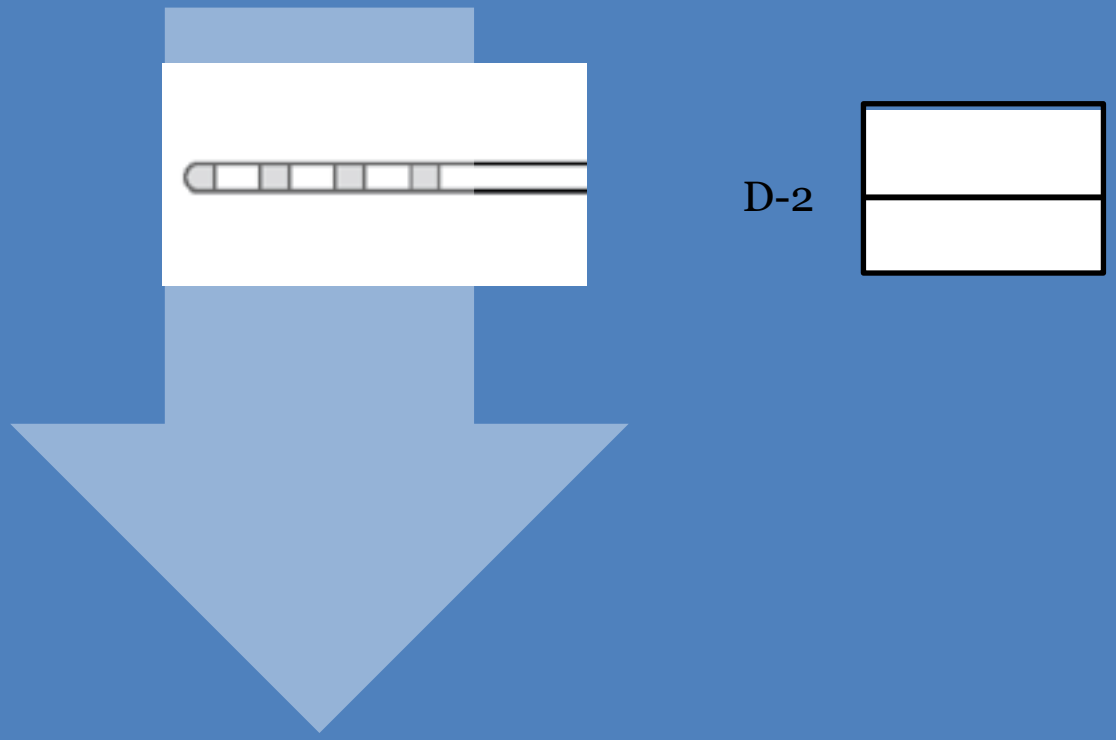
ENSITE X EP SYSTEM - Experience

- HD grid & Omnipolar mapping

ACTIVATION WAVEFRONT PARALLEL TO THE ELECTRODE PAIR

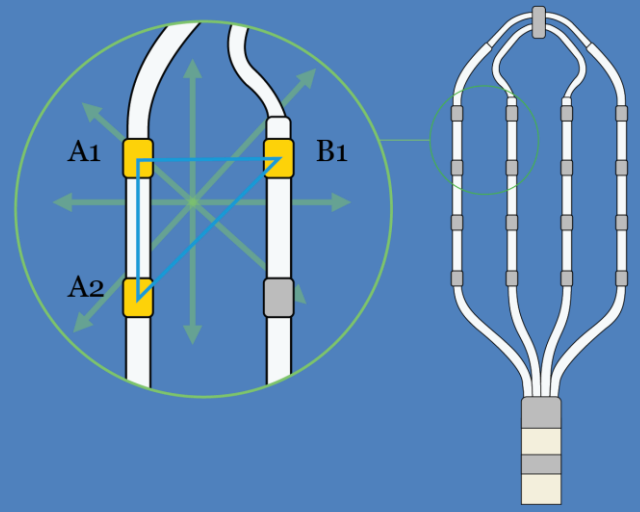


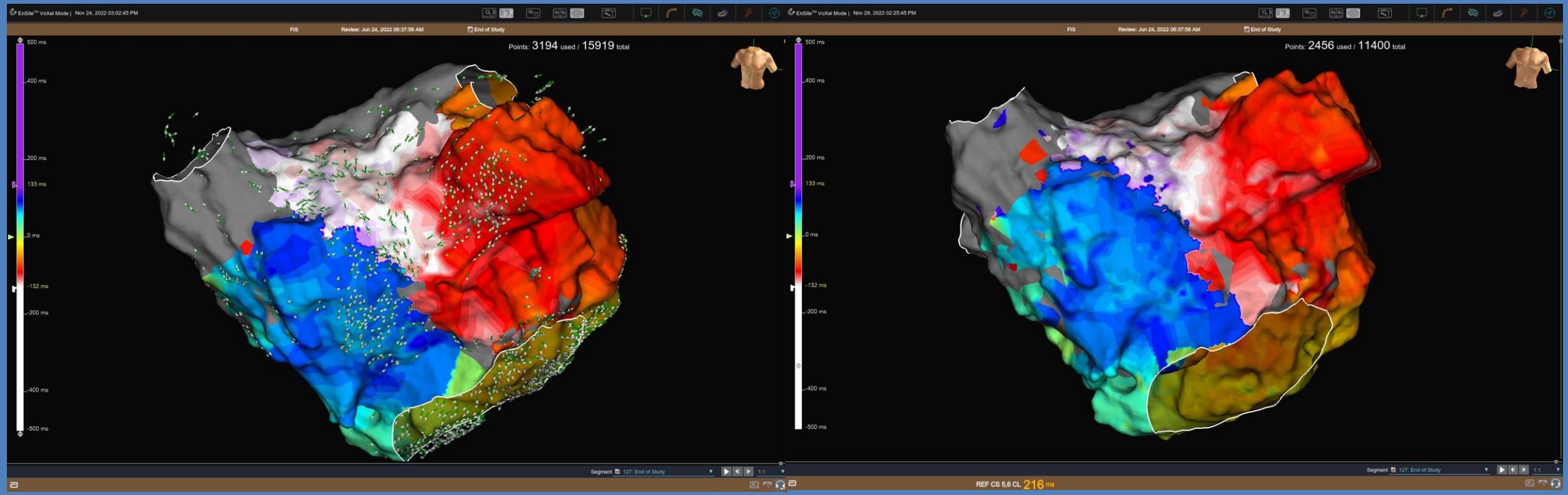
ACTIVATION WAVEFRONT PERPENDICULAR TO THE ELECRODE PAIR

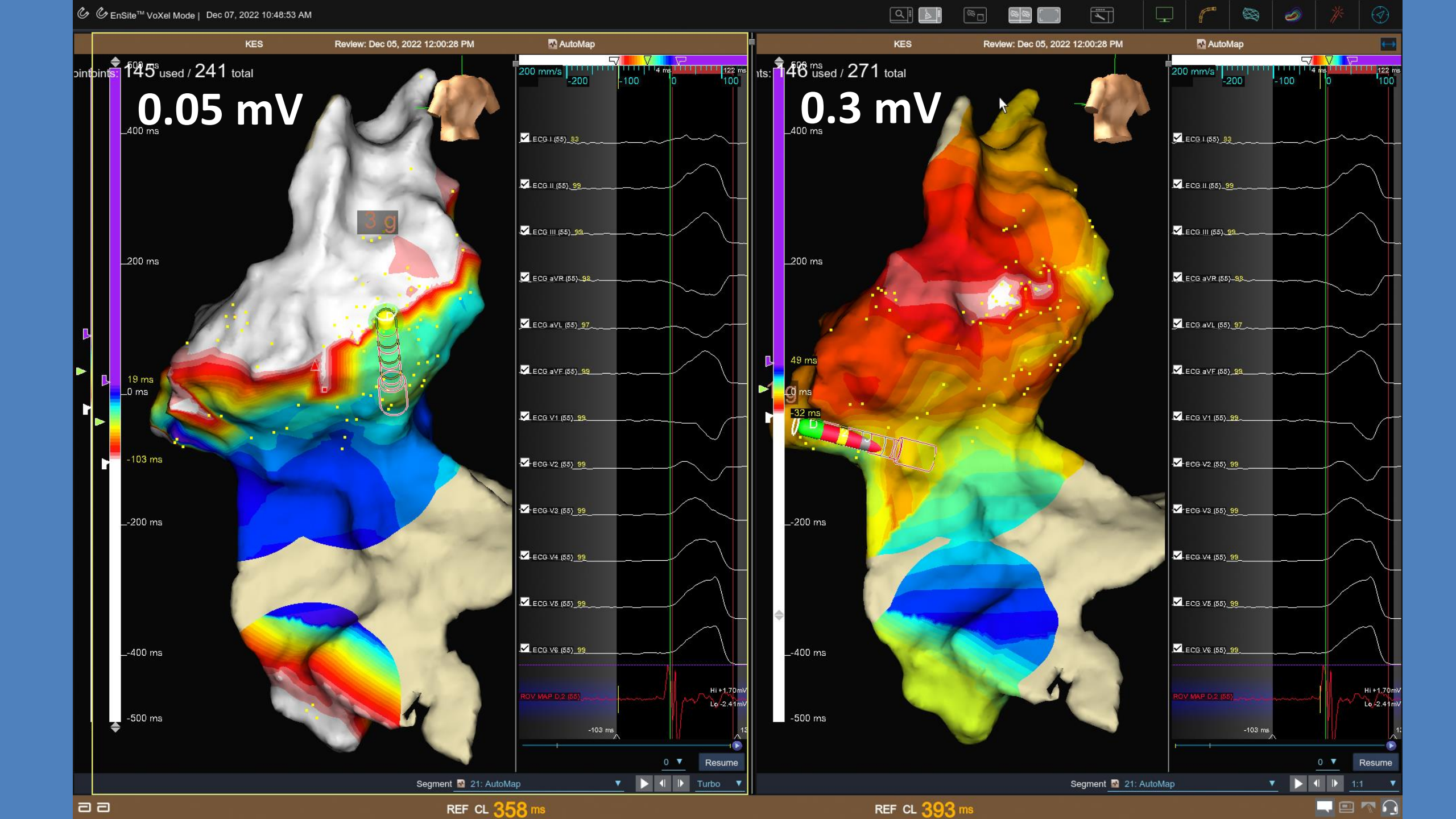


ENSITE X EP SYSTEM - Experience

- **HD grid & Omnipolar mapping**
  - Clear **LAT map**, elimination of bipolar blindness

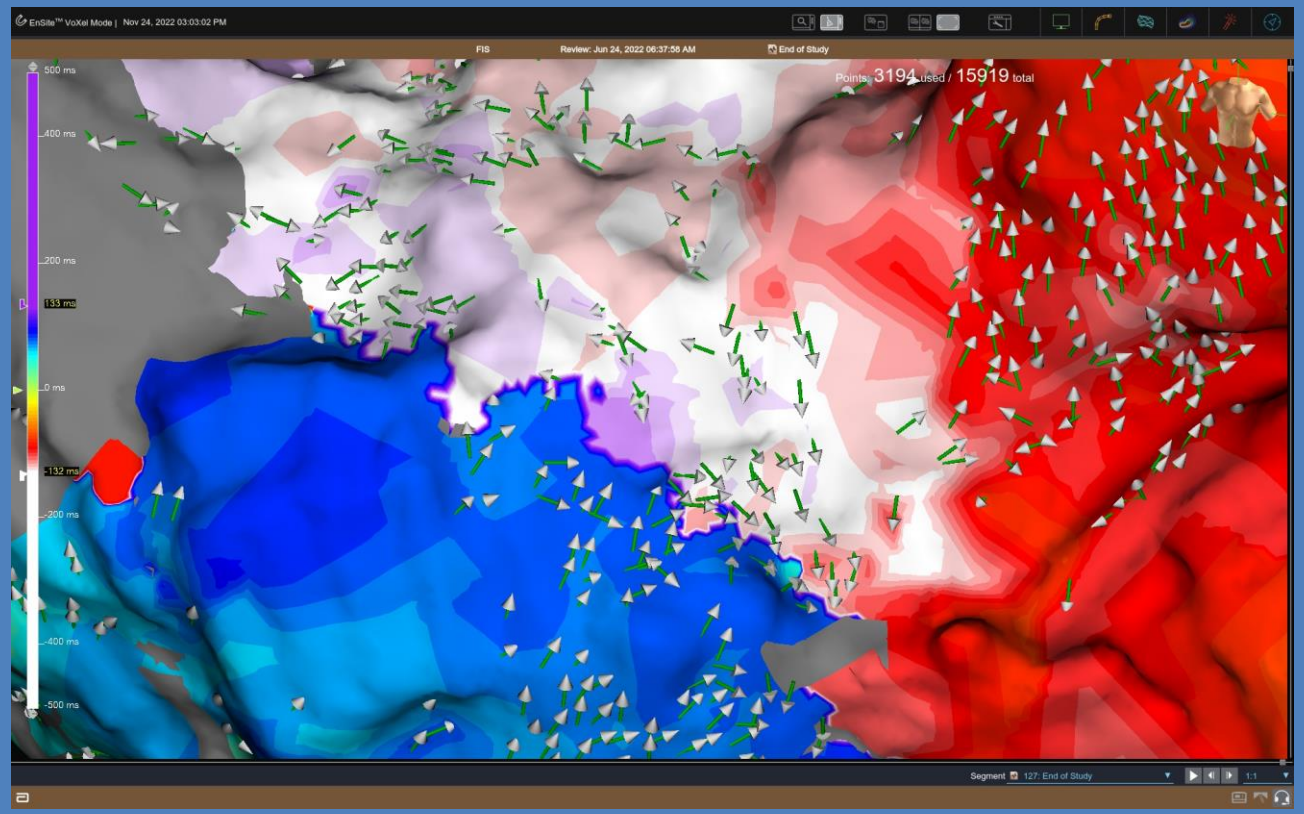


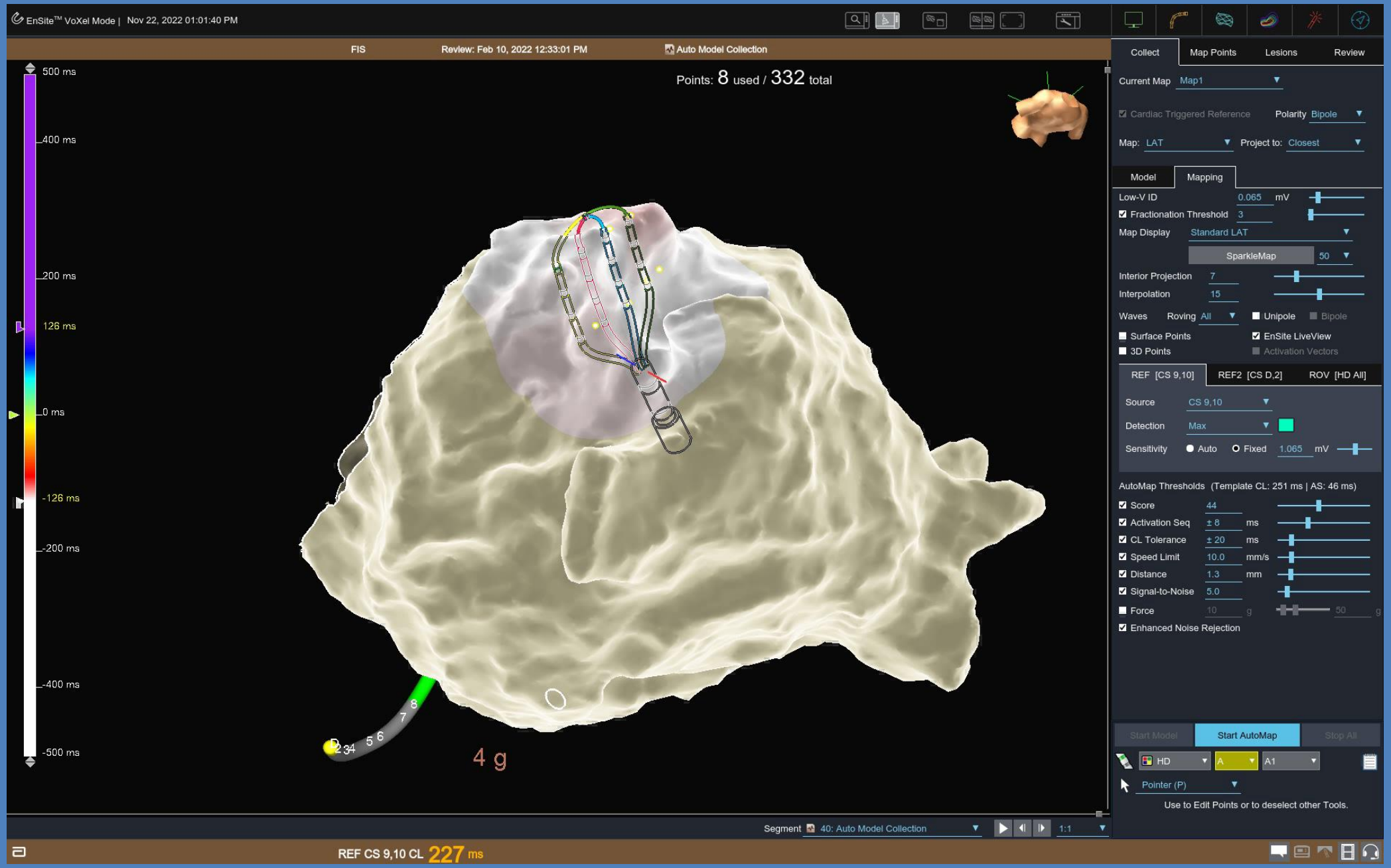


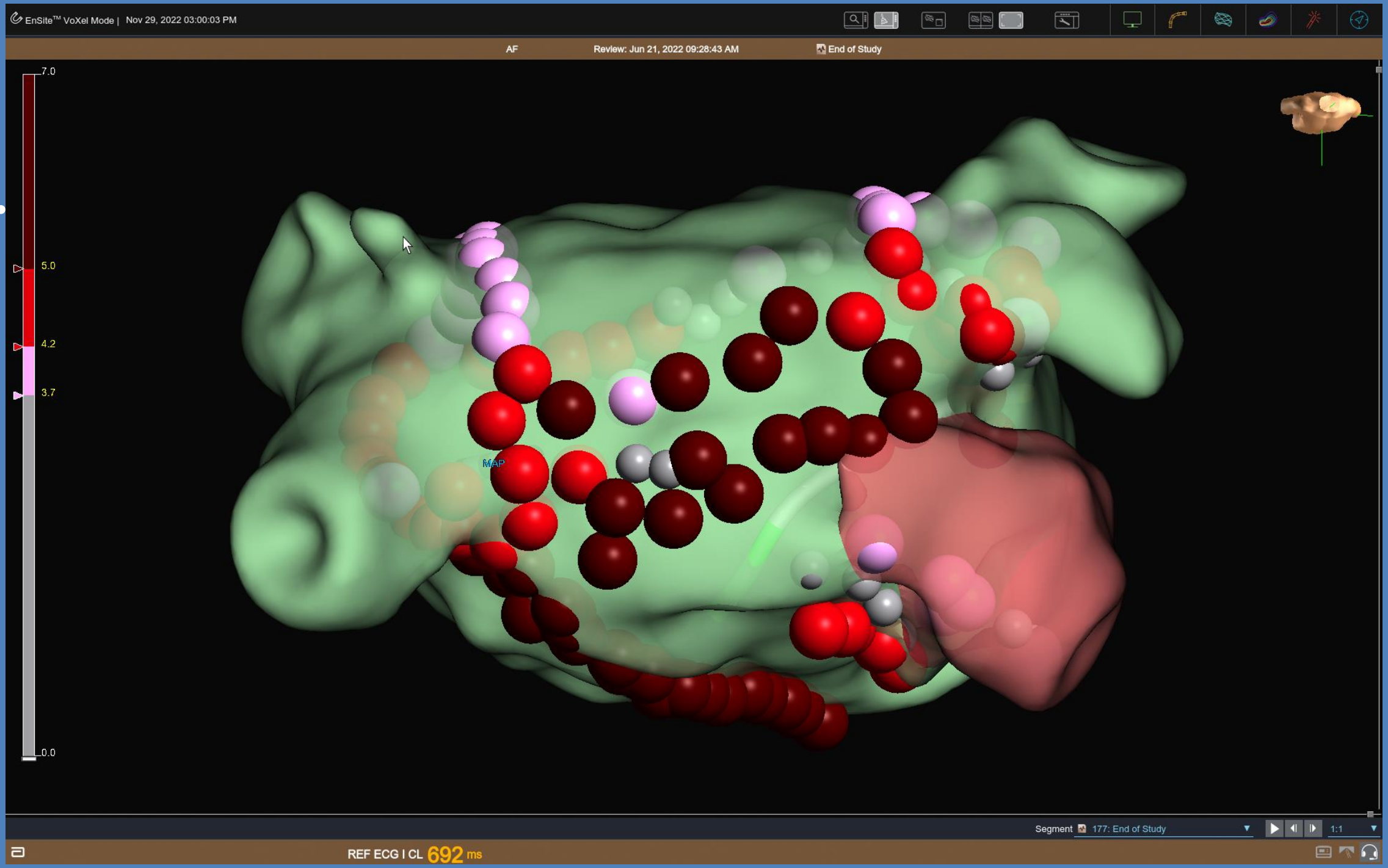

EnSite™ VoXel Mode | Dec 07, 2022 10:48:53 AM
KES
Review: Dec 05, 2022 12:00:28 PM
AutoMap
145 used / 241 total
0.05 mV
400 ms
200 ms
19 ms
0 ms
-103 ms
-200 ms
-400 ms
-500 ms
3 g
200 mm/s
-200
-100
0
100
4 ms
122 ms
ECG I (55)
ECG II (55)
ECG III (55)
ECG aVR (55)
ECG aVL (55)
ECG aVF (55)
ECG V1 (55)
ECG V2 (55)
ECG V3 (55)
ECG V4 (55)
ECG V5 (55)
ECG V6 (55)
ROV MAP D,2 (55)
Hi +1.70mV
Lo -2.41mV
-103 ms
Resume
Segment 21: AutoMap
Turbo
REF CL 358 ms
KES
Review: Dec 05, 2022 12:00:28 PM
AutoMap
146 used / 271 total
0.3 mV
400 ms
200 ms
49 ms
0 ms
-32 ms
-200 ms
-400 ms
-500 ms
200 mm/s
-200
-100
0
100
4 ms
122 ms
ECG I (55)
ECG II (55)
ECG III (55)
ECG aVR (55)
ECG aVL (55)
ECG aVF (55)
ECG V1 (55)
ECG V2 (55)
ECG V3 (55)
ECG V4 (55)
ECG V5 (55)
ECG V6 (55)
ROV MAP D,2 (55)
Hi +1.70mV
Lo -2.41mV
-103 ms
Resume
Segment 21: AutoMap
1:1
REF CL 393 ms

ENSITE X EP SYSTEM - Experience

- **HD grid & Omnipolar mapping**
  - To get clear map the setting of **sensitivity threshold** is crucial!
  - Setting based on few first collected LAT points
  - Algorithm **First deflection and Last deflection (VT‘s)**
  - **Activation Vectors –** identification of block line (OT certainty > 0,4)

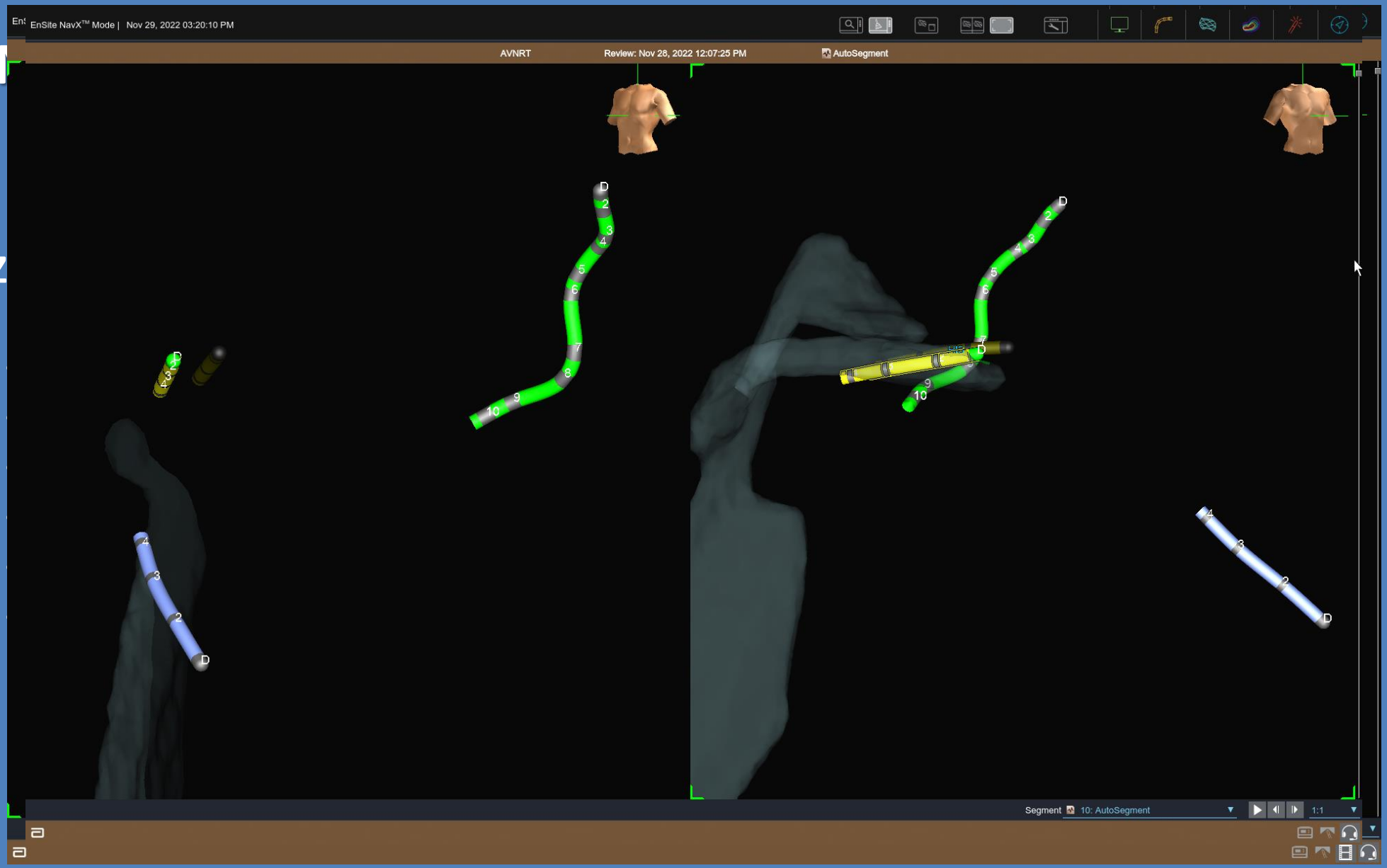



EnSite™ VoXel Mode | Nov 22, 2022 01:01:40 PM
FIS
Review: Feb 10, 2022 12:33:01 PM
Auto Model Collection
Points: 8 used / 332 total
500 ms
400 ms
200 ms
126 ms
0 ms
-126 ms
-200 ms
-400 ms
-500 ms
4 g
Collect
Map Points
Lesions
Review
Current Map Map1
Cardiac Triggered Reference
Polarity Bipole
Map: LAT
Project to: Closest
Model
Mapping
Low-V ID 0.065 mV
Fractionation Threshold 3
Map Display Standard LAT
SparkleMap 50
Interior Projection 7
Interpolation 15
Waves Roving All Unipole Bipole
Surface Points
EnSite LiveView
3D Points
Activation Vectors
REF [CS 9,10]
REF2 [CS D,2]
ROV [HD All]
Source CS 9,10
Detection Max
Sensitivity Auto Fixed 1.065 mV
AutoMap Thresholds (Template CL: 251 ms | AS: 46 ms)
Score 44
Activation Seq ± 8 ms
CL Tolerance ± 20 ms
Speed Limit 10.0 mm/s
Distance 1.3 mm
Signal-to-Noise 5.0
Force 10 g 50 g
Enhanced Noise Rejection
Start Model
Start AutoMap
Stop All
HD
A
A1
Pointer (P)
Use to Edit Points or to deselect other Tools.
Segment 40: Auto Model Collection
1:1
REF CS 9,10 CL 227 ms


EnSite™ VoXel Mode | Nov 29, 2022 03:00:03 PM
AF
Review: Jun 21, 2022 09:28:43 AM
End of Study
7.0
5.0
4.2
3.7
0.0
MAP
Segment
177: End of Study
1:1
REF ECG I CL 692 ms

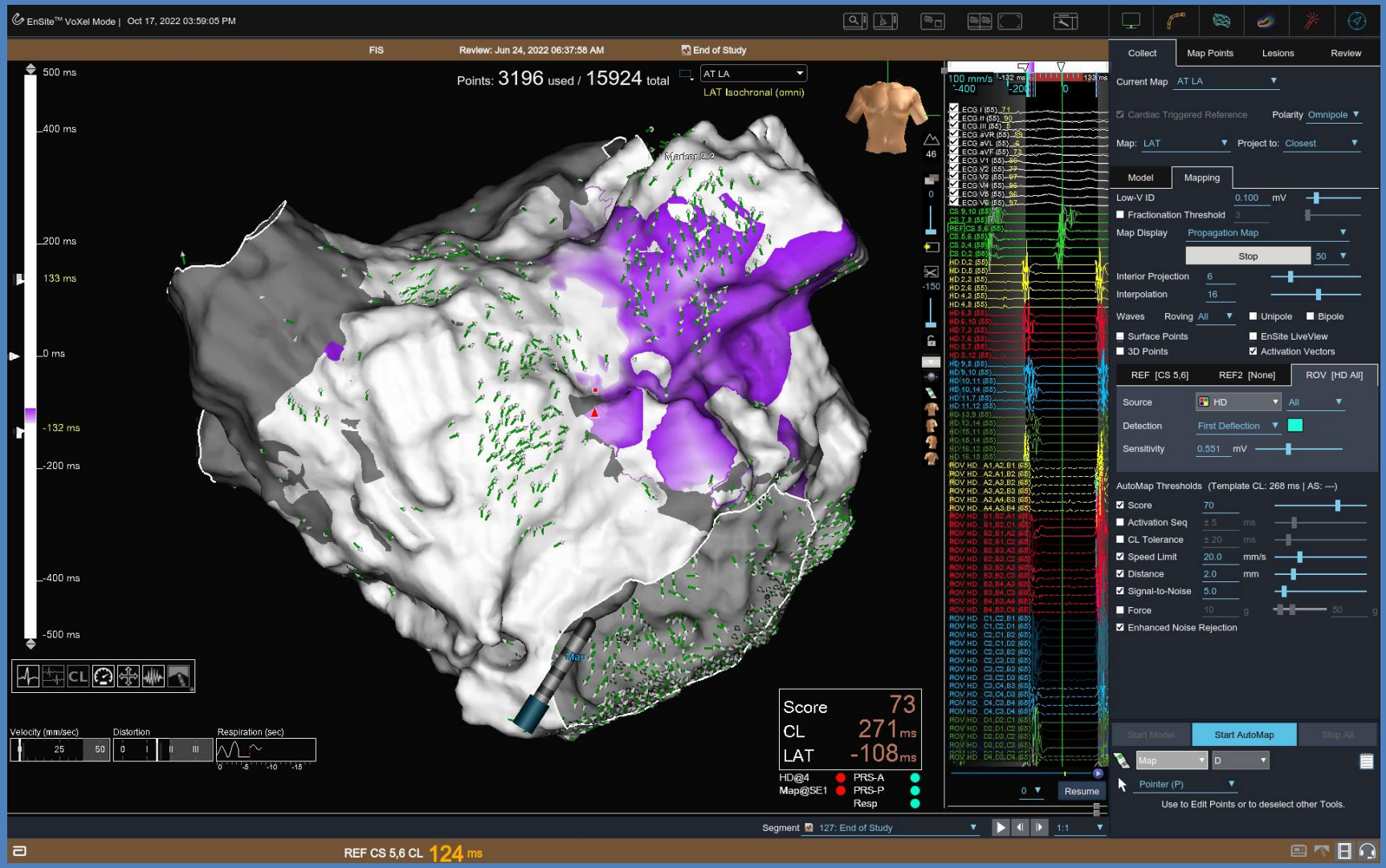
EI

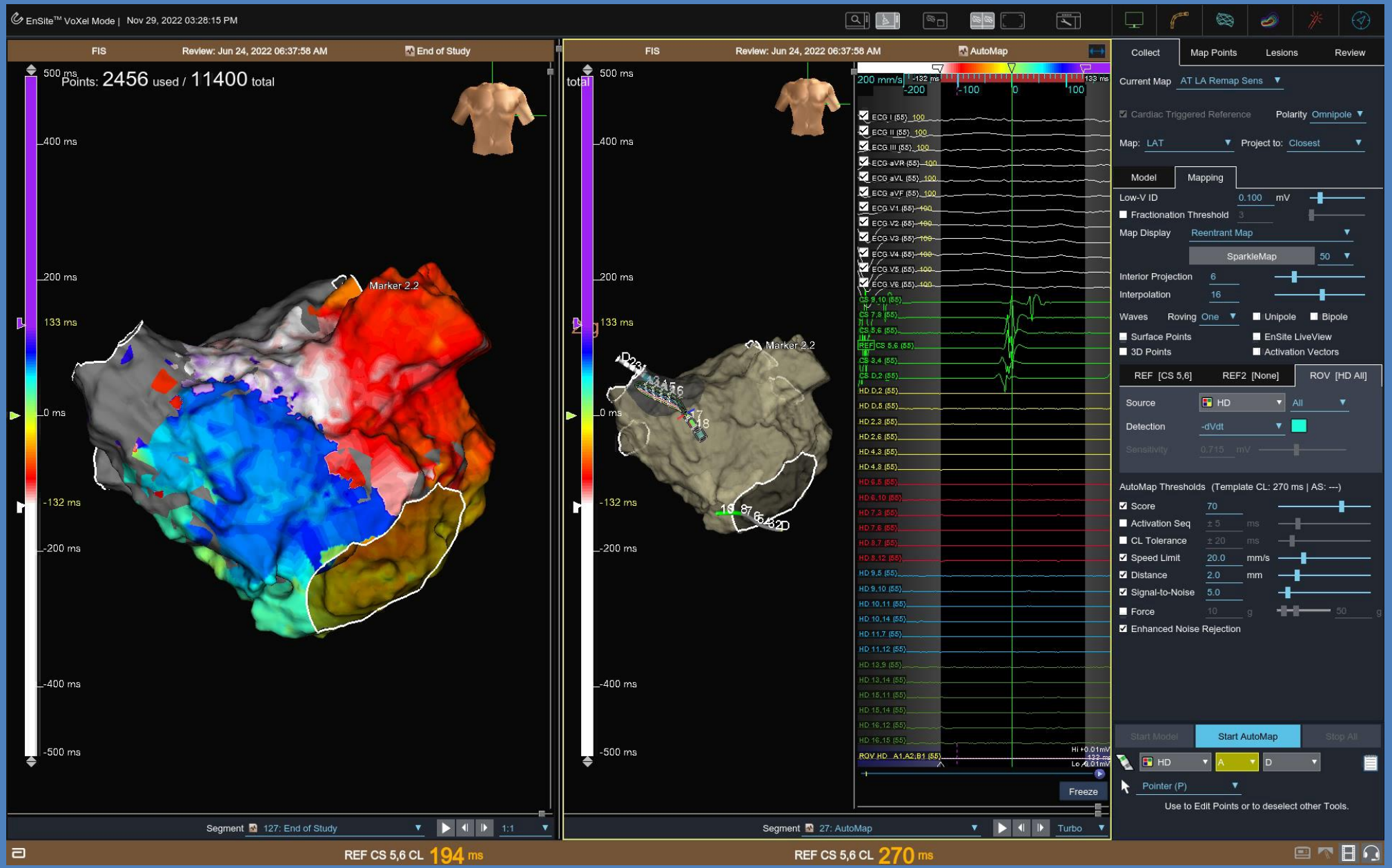
- Z


EnSite NavX™ Mode | Nov 29, 2022 03:20:10 PM
AVNRT
Review: Nov 28, 2022 12:07:25 PM
AutoSegment
Segment
10: AutoSegment
1:1

ENSITE X EP SYSTEM – We appreciate

- Propagation map



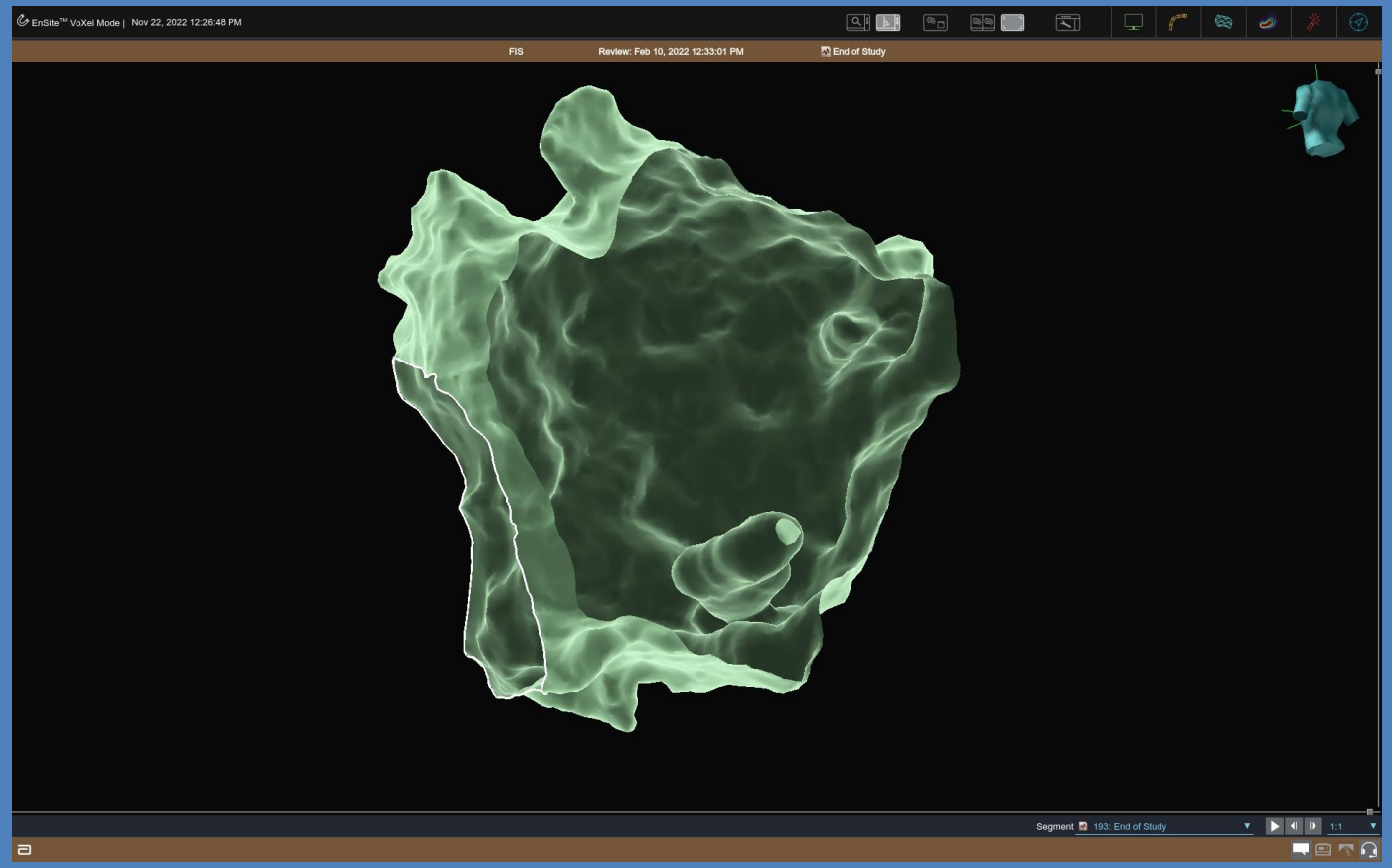

EnSite™ VoXel Mode | Nov 29, 2022 03:28:15 PM
FIS
Review: Jun 24, 2022 06:37:58 AM
End of Study
Points: 2456 used / 11400 total
500 ms
400 ms
200 ms
133 ms
0 ms
-132 ms
-200 ms
-400 ms
-500 ms
Marker 2.2
Segment 127: End of Study
1:1
FIS
Review: Jun 24, 2022 06:37:58 AM
AutoMap
total
Marker 2.2
200 mm/s
Segment 27: AutoMap
Turbo
Freeze
Collect
Map Points
Lesions
Review
Current Map AT LA Remap Sens
Cardiac Triggered Reference
Polarity Omnipole
Map: LAT
Project to: Closest
Model
Mapping
Low-V ID 0.100 mV
Fractionation Threshold 3
Map Display Reentrant Map
SparkleMap 50
Interior Projection 6
Interpolation 16
Waves Roving One Unipole Bipole
Surface Points
EnSite LiveView
3D Points
Activation Vectors
REF [CS 5,6]
REF2 [None]
ROV [HD All]
Source HD All
Detection -dVdt
Sensitivity 0.715 mV
AutoMap Thresholds (Template CL: 270 ms | AS: ---)
Score 70
Activation Seq ± 5 ms
CL Tolerance ± 20 ms
Speed Limit 20.0 mm/s
Distance 2.0 mm
Signal-to-Noise 5.0
Force 10 g 50 g
Enhanced Noise Rejection
Start Model
Start AutoMap
Stop All
HD A D
Pointer (P)
Use to Edit Points or to deselect other Tools.
REF CS 5,6 CL 194 ms
REF CS 5,6 CL 270 ms

ENSITE X EP SYSTEM – We miss/suggest

- Option to resize the **Activation Vectors**
- Keyboard shortcut for **Delete Points**
- Imporve **Respiration algorithm** (stable only in GA)
- Option to work during **collecting respiration data** (12 s) ☺
- Option to assign **Automarks** to Model, e. g. **AFib** in LA, **CTI** in RA
- Option to display **actual values** of AutoMap parameters for sele

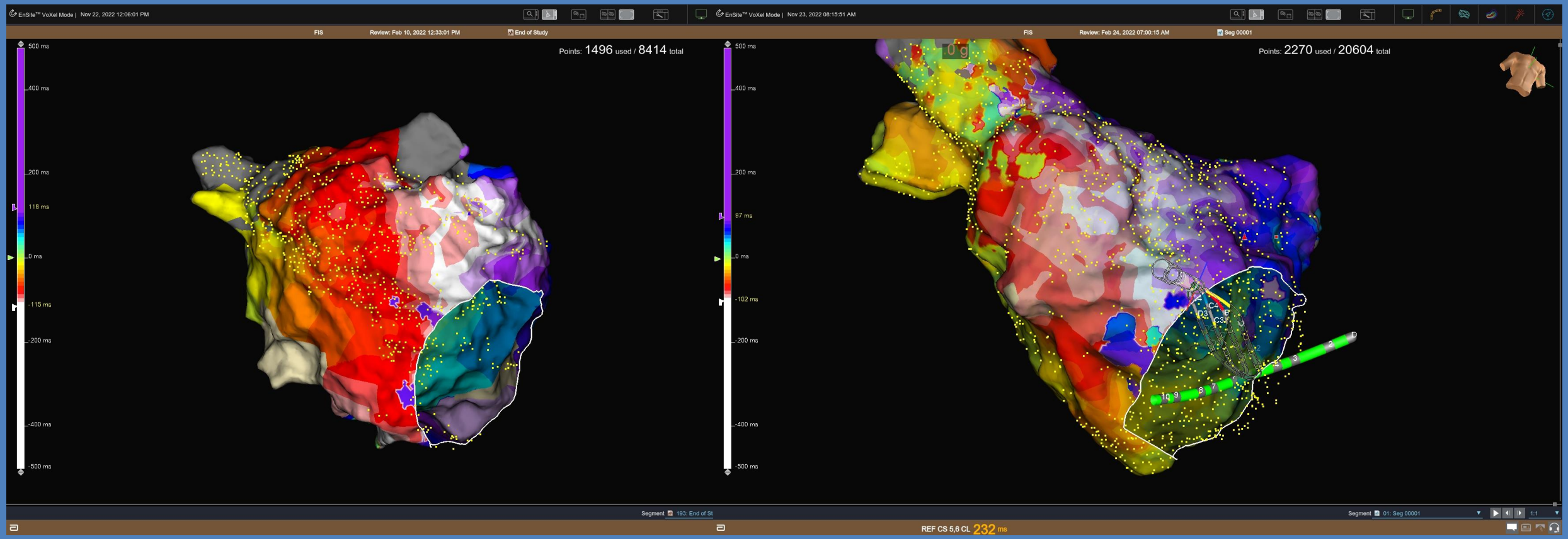
ENSITE X EP SYSTEM – We miss/suggest

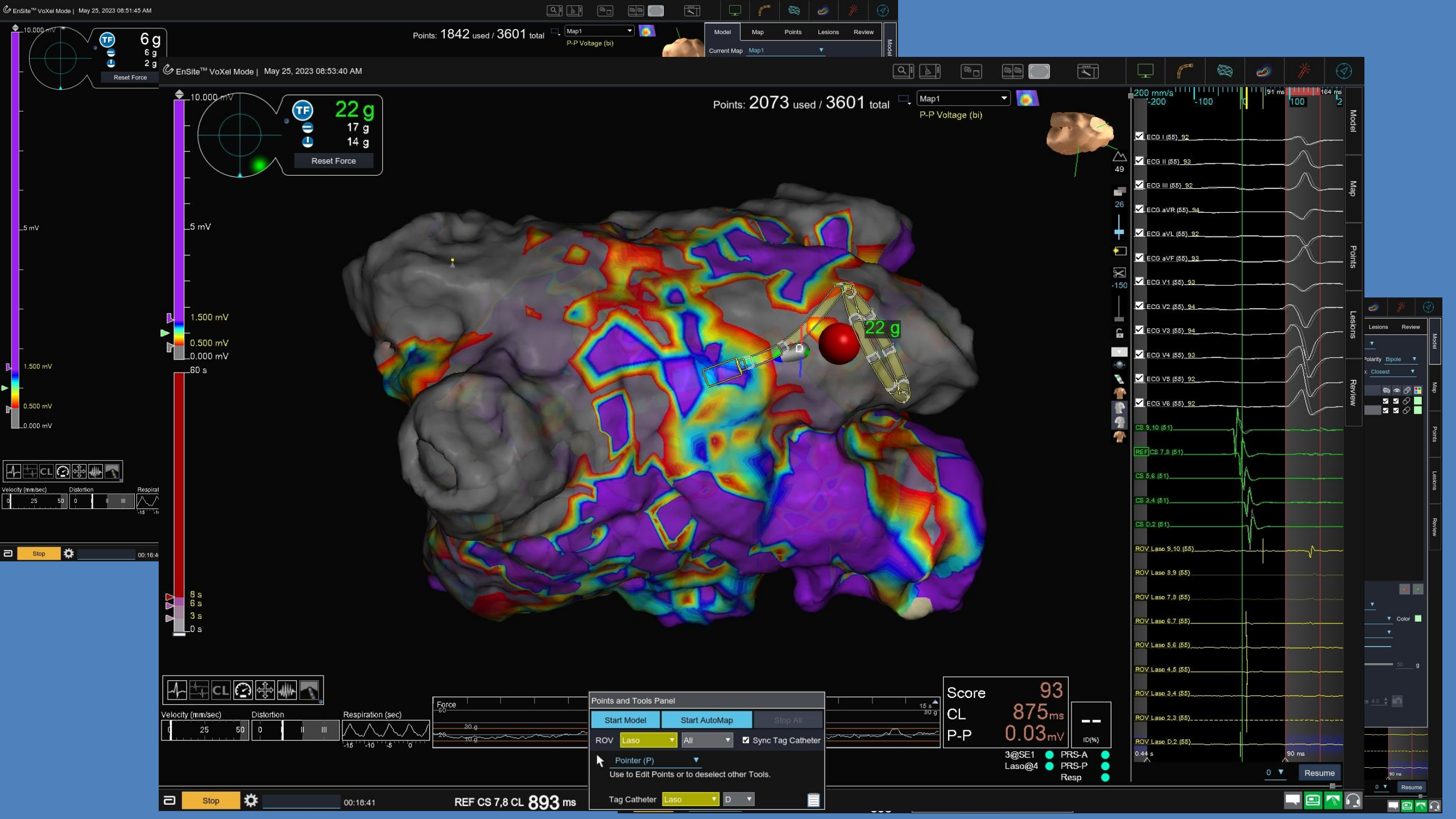
- Algorithm for elimiantion of inner geometry structures

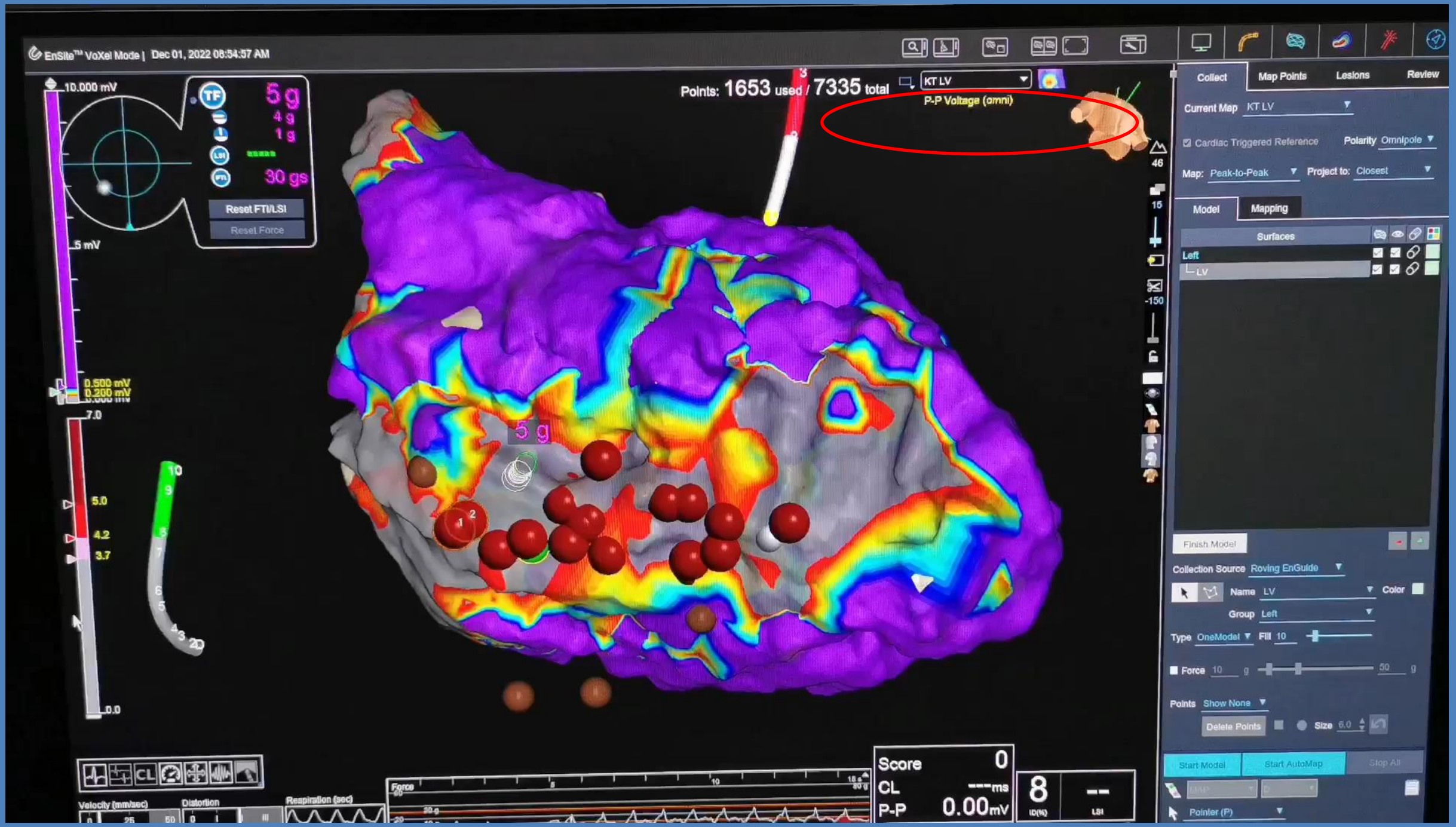


ENSITE X EP SYSTEM – We miss/suggest

- Filtering outliers…..

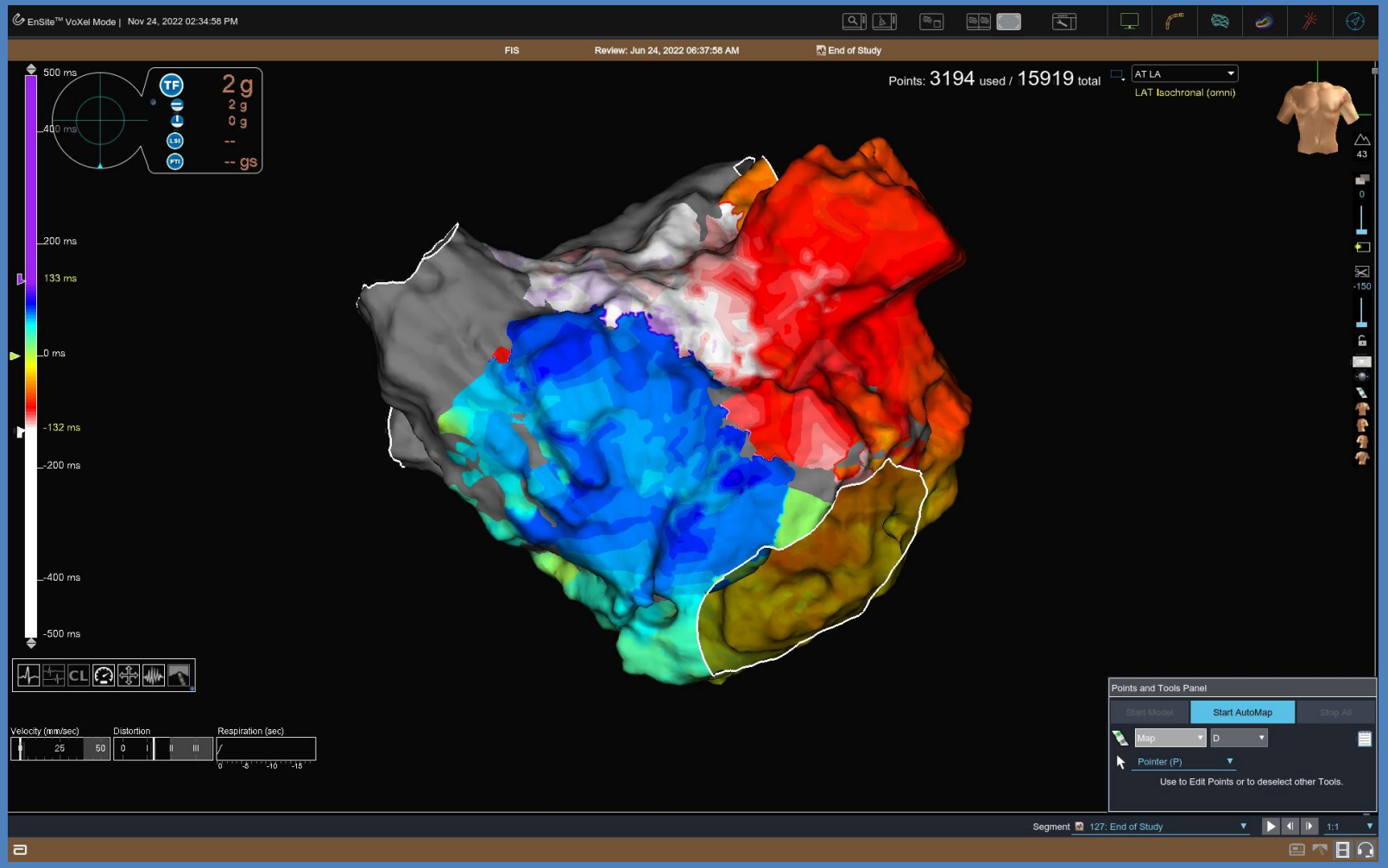



EnSite™ VoXel Mode | May 25, 2023 08:53:40 AM
Points: 2073 used / 3601 total
Map1
P-P Voltage (bi)
22 g
17 g
14 g
Reset Force
10.000 mV
5 mV
1.500 mV
0.500 mV
0.000 mV
60 s
8 s
6 s
3 s
0 s
Velocity (mm/sec)
Distortion
Respiration (sec)
Force
Points and Tools Panel
Start Model
Start AutoMap
Stop All
ROV
Laso
All
Sync Tag Catheter
Pointer (P)
Use to Edit Points or to deselect other Tools.
Tag Catheter
Laso
D
Score 93
CL 875 ms
P-P 0.03 mV
3@SE1
Laso@4
PRS-A
PRS-P
Resp
Stop
00:18:41
REF CS 7,8 CL 893 ms
Model
Map
Points
Lesions
Review
Resume


EnSite™ VoXel Mode | Dec 01, 2022 08:54:57 AM
Points: 1653 used / 7335 total
KT LV
P-P Voltage (omni)
10.000 mV
5 mV
5g
4g
1g
30 gs
Reset FTI/LSI
Reset Force
0.500 mV
0.200 mV
7.0
5.0
4.2
3.7
0.0
5 g
Collect
Map Points
Lesions
Review
Current Map KT LV
Cardiac Triggered Reference
Polarity Omnipole
Map: Peak-to-Peak
Project to: Closest
Model
Mapping
Surfaces
Left
LV
Finish Model
Collection Source Roving EnGuide
Name LV
Color
Group Left
Type OneModel
Fill 10
Force 10 g 50 g
Points Show None
Delete Points
Size 6.0
Start Model
Start AutoMap
Stop All
Pointer (P)
Score 0
CL ---ms
P-P 0.00mV
8
ID(%)
--
LSI
Velocity (mm/sec)
Distortion
Respiration (sec)
Force

ENSITE X EP SYSTEM – Tips & Traps

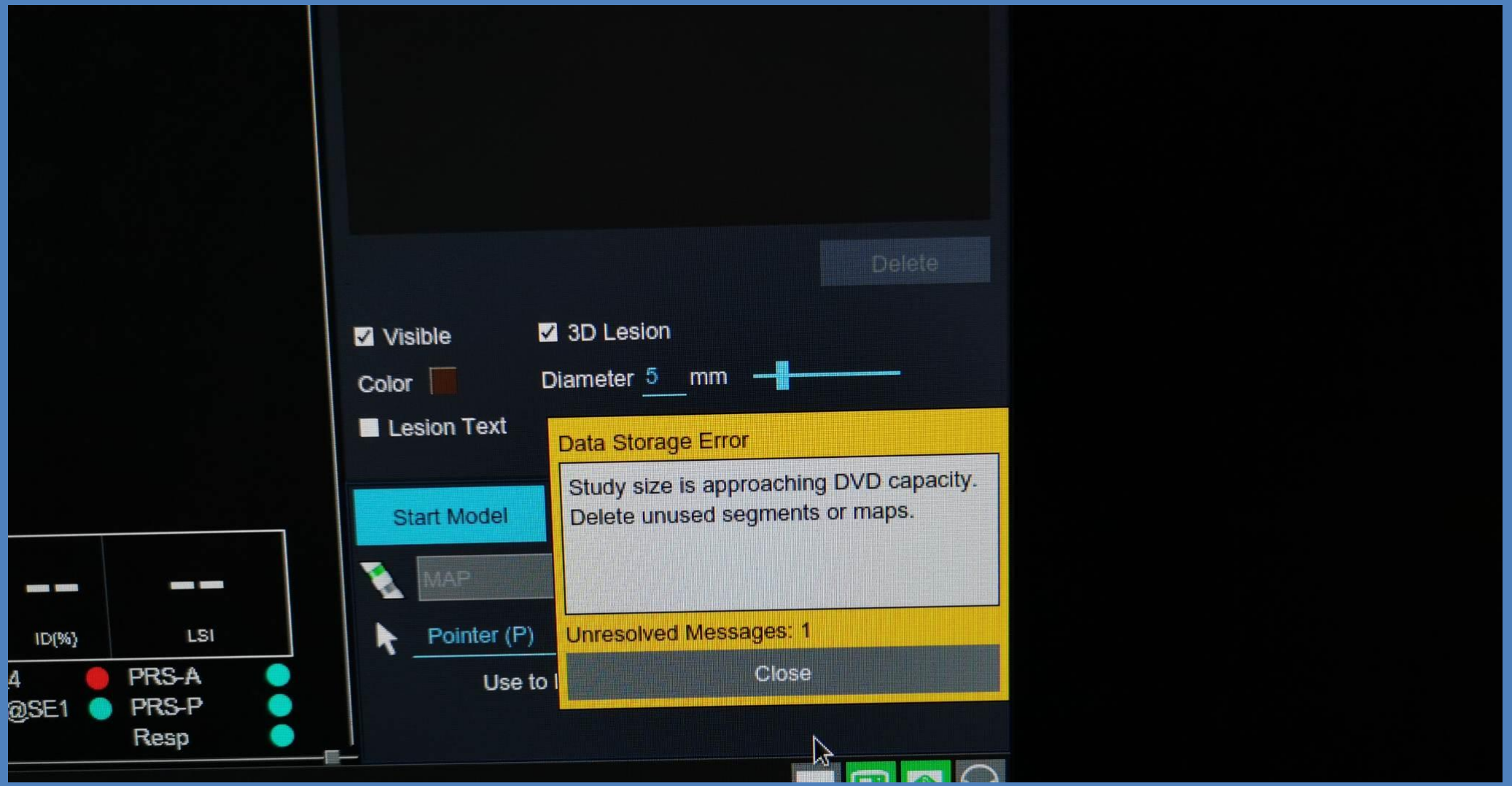
- **Cropping** the geometry



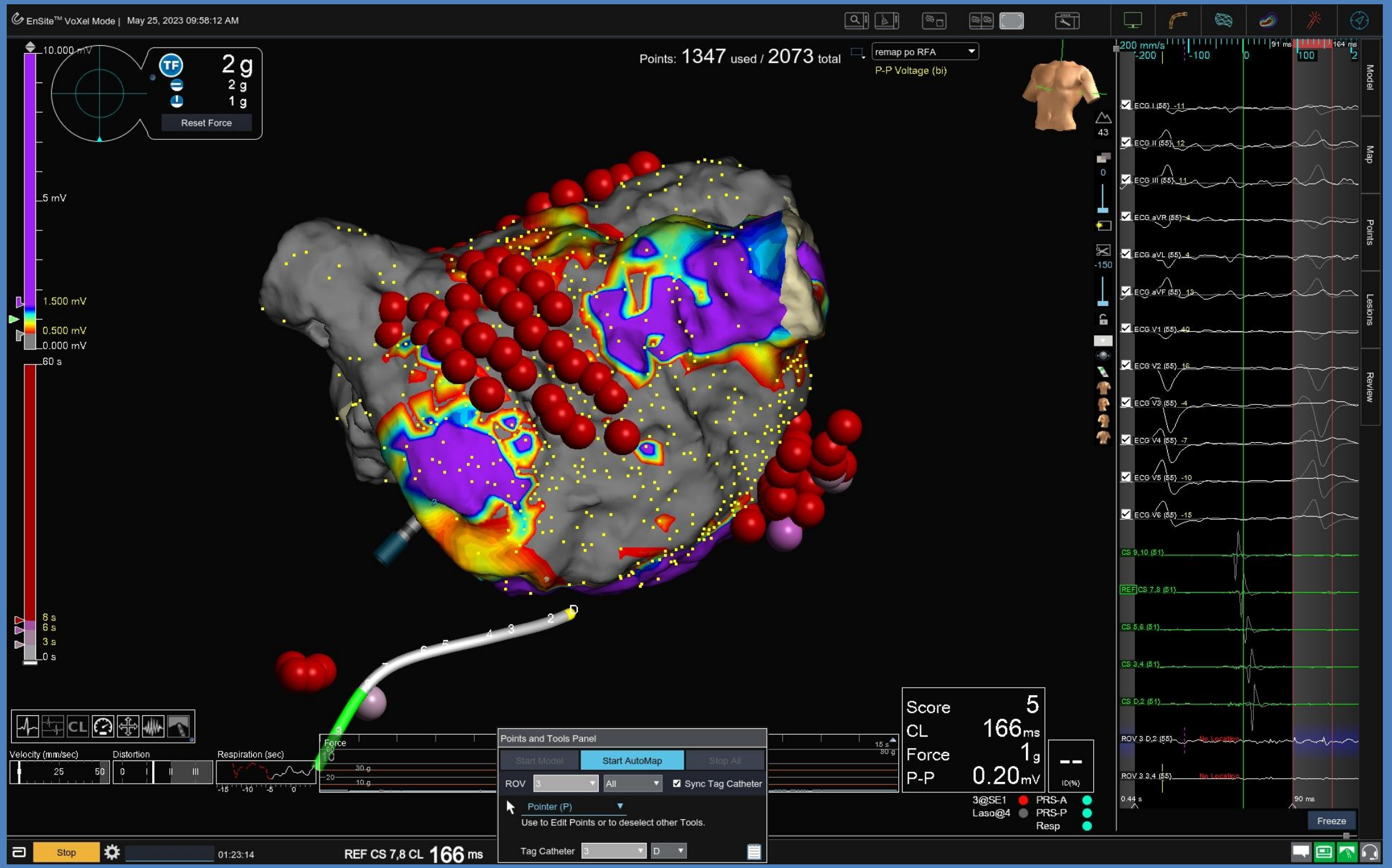
ENSITE X EP SYSTEM – Tips & Traps

- **Turning on the system**
  - Booting sequence: PC – Amplifier – Generator – TactiSys – CoolFlow
  - Cabel to magnetic frame ?
  - Time betweeen start of PC and amplifier

ENSITE X EP SYSTEM – What annoys us ☺




EnSite™ VoXel Mode | May 25, 2023 01:57:48 PM
AF
Review: May 25, 2023 07:58:08 AM
RF Session 7
Model
Map
Points
Lesions
Review
No map selected
Order by Time
54: Laso Proximal out of sh… 0 min 10 s
55: RF Session 1 0 min 31 s
56: 3 Proximal in sheath 0 min 10 s
57: 3 Proximal out of sheath 0 min 10 s
58: RF Session 2 0 min 30 s
59: RF Session 3 0 min 30 s
60: 3 Proximal in sheath 0 min 10 s
61: RF Session 4 0 min 30 s
62: RF Session 5 0 min 31 s
63: RF Session 6 0 min 30 s
64: 3 Distal in sheath 0 min 10 s
65: 3 Distal out of sheath 0 min 10 s
66: RF Session 7 0 min 30 s
67: 3 Proximal out of sheath 0 min 10 s
68: RF Session 8 0 min 31 s
69: RF Session 9 0 min 31 s
70: 3 Proximal in sheath 0 min 10 s
71: 3 Proximal out of sheath 0 min 10 s
72: 3 Proximal in sheath 0 min 10 s
73: RF Session 10 0 min 30 s
74: 3 Proximal out of sheath 0 min 10 s
75: 3 Proximal in sheath 0 min 10 s
76: 3 Distal in sheath 0 min 10 s
77: 3 Distal out of sheath 0 min 10 s
78: 3 Proximal out of sheath 0 min 10 s
79: AutoSegment 0 min 10 s
80: RF Session 11 0 min 30 s
81: RF Session 12 0 min 29 s
82: RF Session 13 0 min 29 s
83: RF Session 14 0 min 29 s
84: RF Session 15 0 min 29 s
85: RF Session 16 0 min 29 s
86: RF Session 17 0 min 28 s
87: RF Session 18 0 min 28 s
88: RF Session 19 0 min 29 s
89: RF Session 20 0 min 28 s
90: RF Session 21 0 min 29 s
91: RF Session 22 0 min 29 s
92: RF Session 23 0 min 28 s
93: RF Session 24 0 min 29 s
Load
Edit
Delete
Start Model
Start AutoMap
Stop All
ROV
Laso
All
Pointer (P)
Use to Edit Points or to deselect other Tools.
Tag Catheter
Laso
D
11 g
11 g
2 g
Velocity (mm/sec)
Distortion
Respiration (sec)
Force
Score 0
CL ---ms
LAT 0ms
3@SE1
Laso@4
PRS-A
PRS-P
Resp
Proximity to EnSite surface:
-3.9 mm
Segment 66: RF Session 7
REF ECG I CL 859 ms


EnSite™ VoXel Mode | May 25, 2023 09:58:12 AM
Points: 1347 used / 2073 total
remap po RFA
P-P Voltage (bi)
2 g
2 g
1 g
Reset Force
10.000 mV
5 mV
1.500 mV
0.500 mV
0.000 mV
60 s
8 s
6 s
3 s
0 s
Model
Map
Points
Lesions
Review
Score 5
CL 166 ms
Force 1 g
P-P 0.20 mV
Points and Tools Panel
Start Model
Start AutoMap
Stop All
ROV
Sync Tag Catheter
Pointer (P)
Use to Edit Points or to deselect other Tools.
Tag Catheter
Velocity (mm/sec)
Distortion
Respiration (sec)
Force
Freeze
Stop
01:23:14
REF CS 7,8 CL 166 ms

ENSITE X EP SYSTEM - Conclusion

- **We used to be……**
  - Exclusively CARTO EP Lab (14 years)
  - The transition to **Ensite X** (7 months) is definitely achievable…….

	Eniste X		CARTO 3	
	PVI	PVI+	PVI	PVI+
No. RFA	55	82	60	90
RFA time (min)	21.9	27.8	21.9	36.1
Fluoro time (min)	2.7	3.8	2.2	2.7
Fluoro dose ($mGycm^2$)	1615	2410	2390*	2961*
Procedure time (min)	90	105	75	105

ENSITE X EP SYSTEM - Conclusion

- **……BUT**
  - Need to have skilled **technicians/engineers** ☺
  - **Ensite X** offers a lot of great features which can be used, just find them ☺
  - **Technican and Ensite X** can provide new views on arrhytmias for MD‘s
  - **Ensite X** is challenging/exciting self-centered, **Does not** let you focus on any other stuff except itself ☺


THANKS FOR
ATTENTION
and
DON'T ASK
ANY QUESTIONS
KeepCalmAndPosters.com