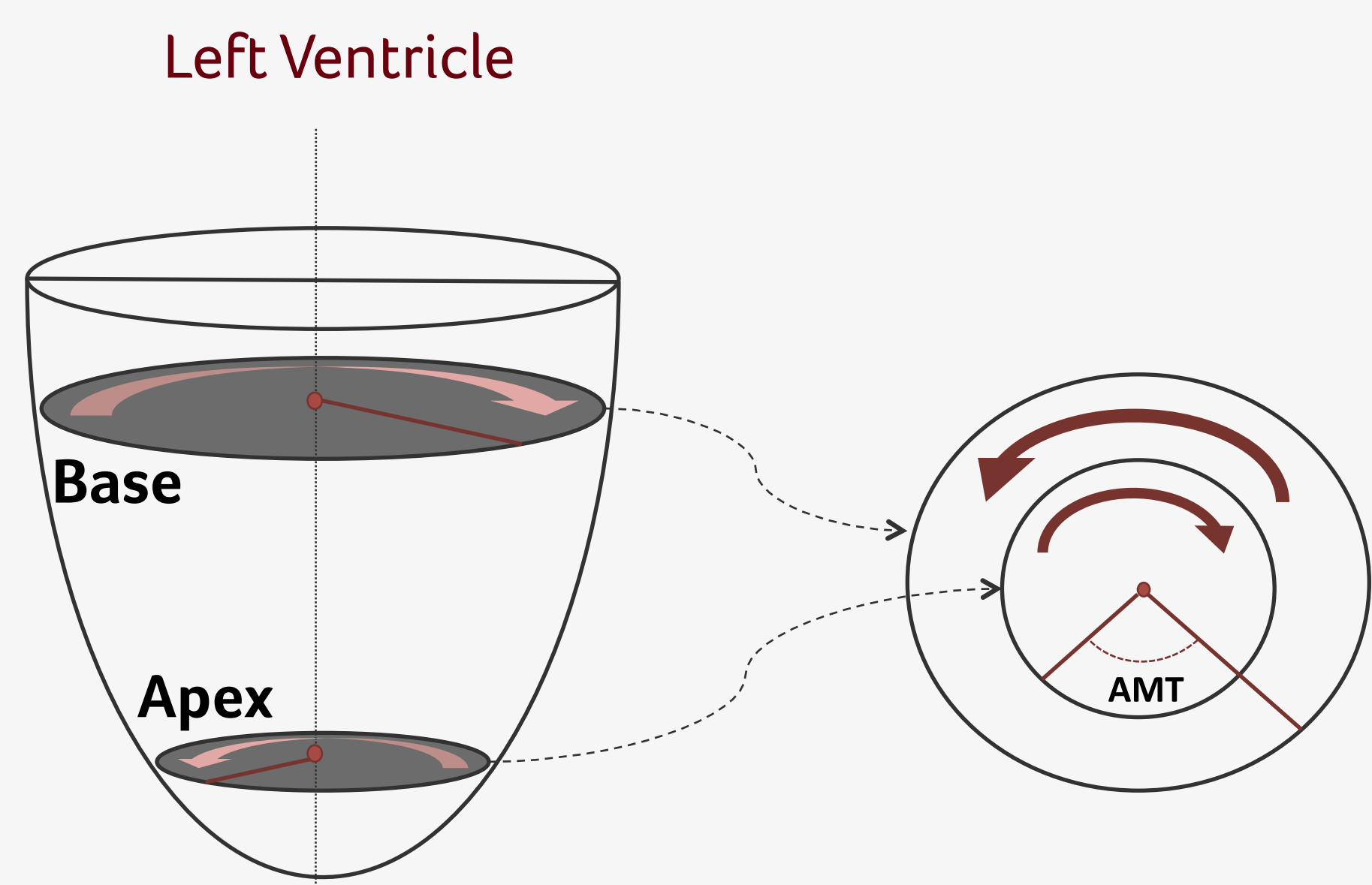


Myocardial torsion estimation with Tagged-MRI in the OsiriX platform

<http://iam.cvc.uab.es>

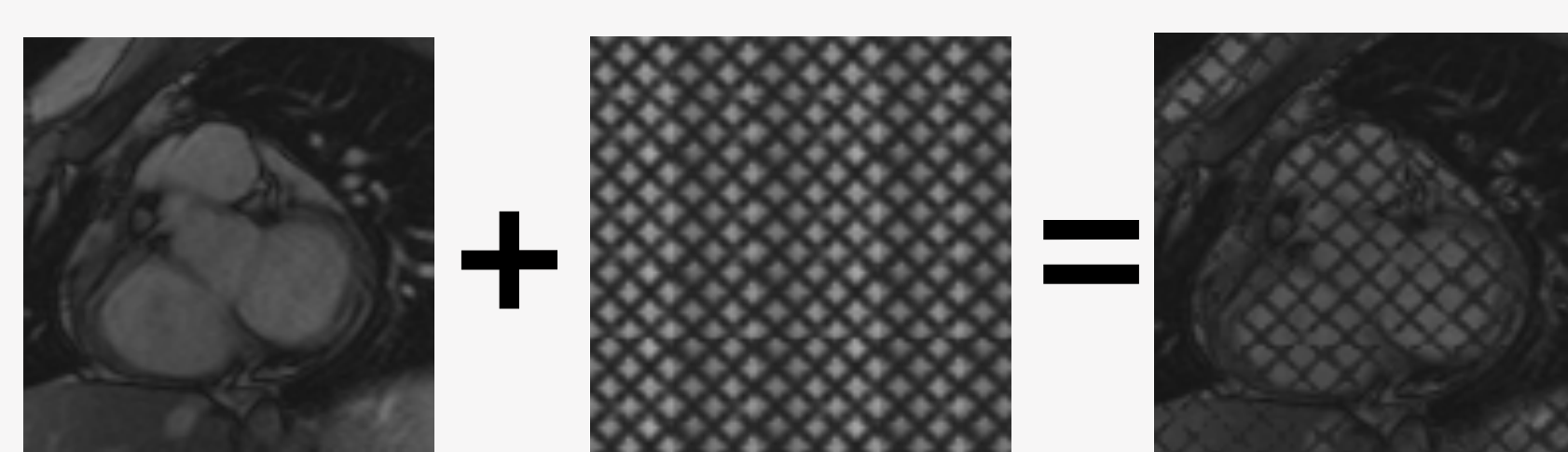
Why torsion?

Myocardial torsion follows myocardial functionality

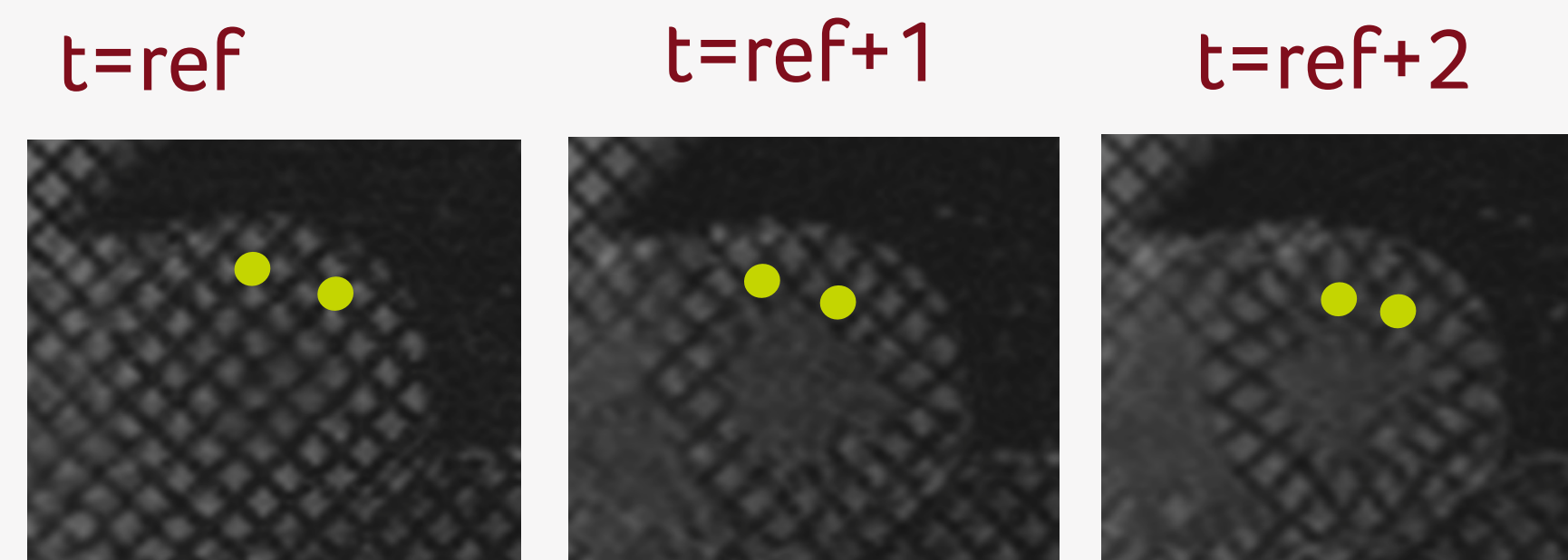


Why Tagged-MRI?

Oversaturation overlays tags over material points

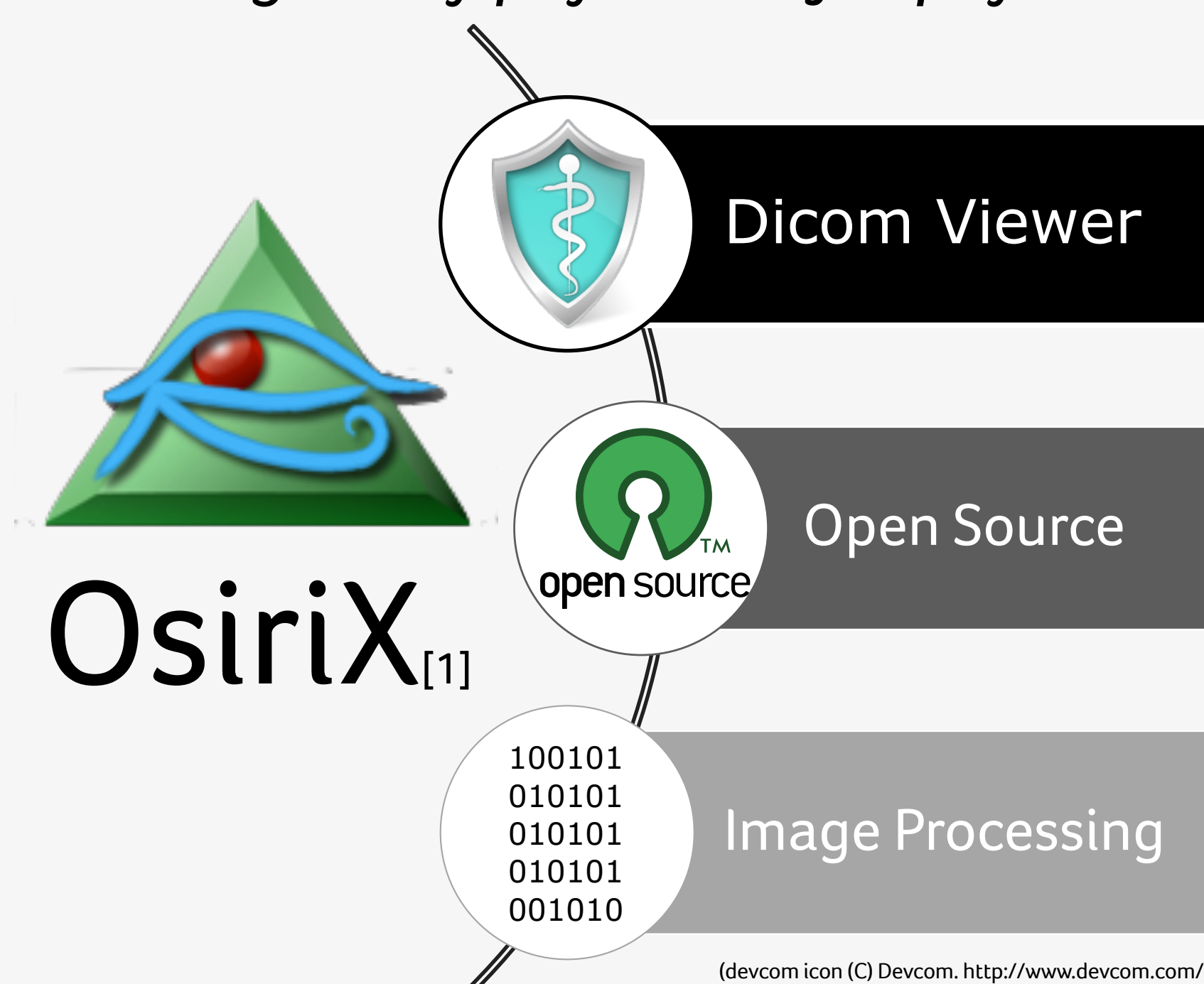


Tag-grid deformation reflects intramural motion



Why Osirix?

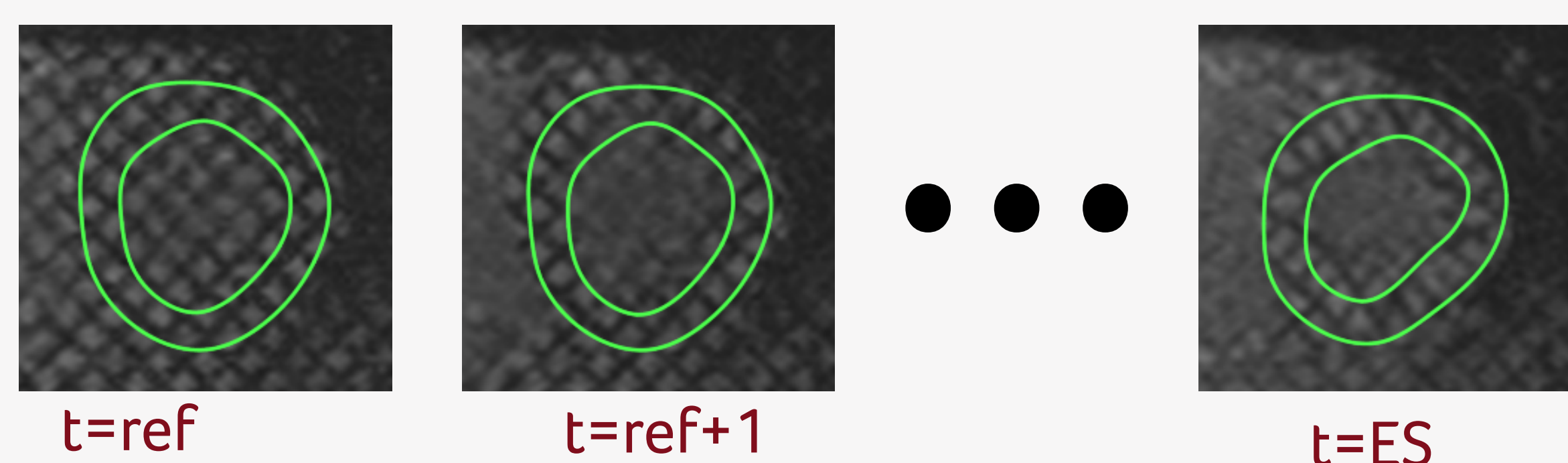
"Designed by physicians for physicians"



Torsion estimation

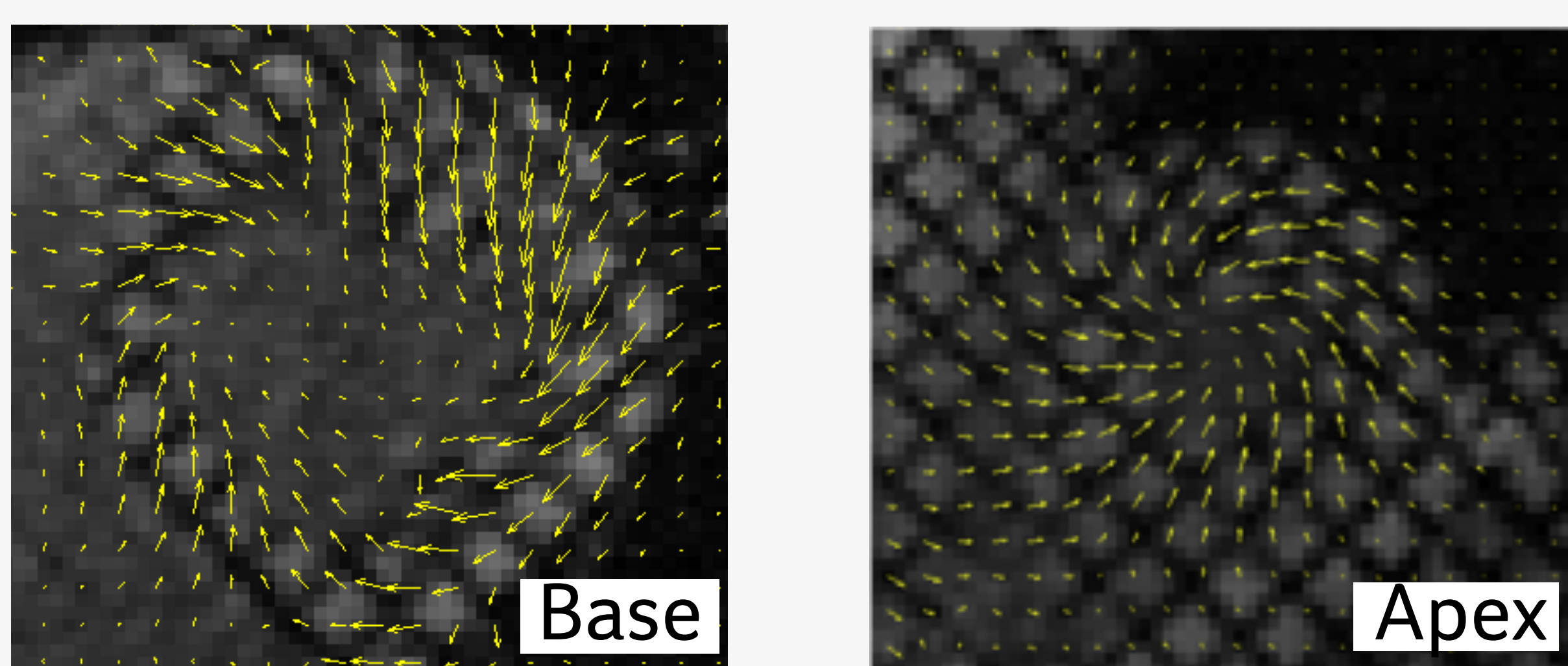
Boundary evolution

DOMAIN: manual segmentation of LV Boundaries at reference frame



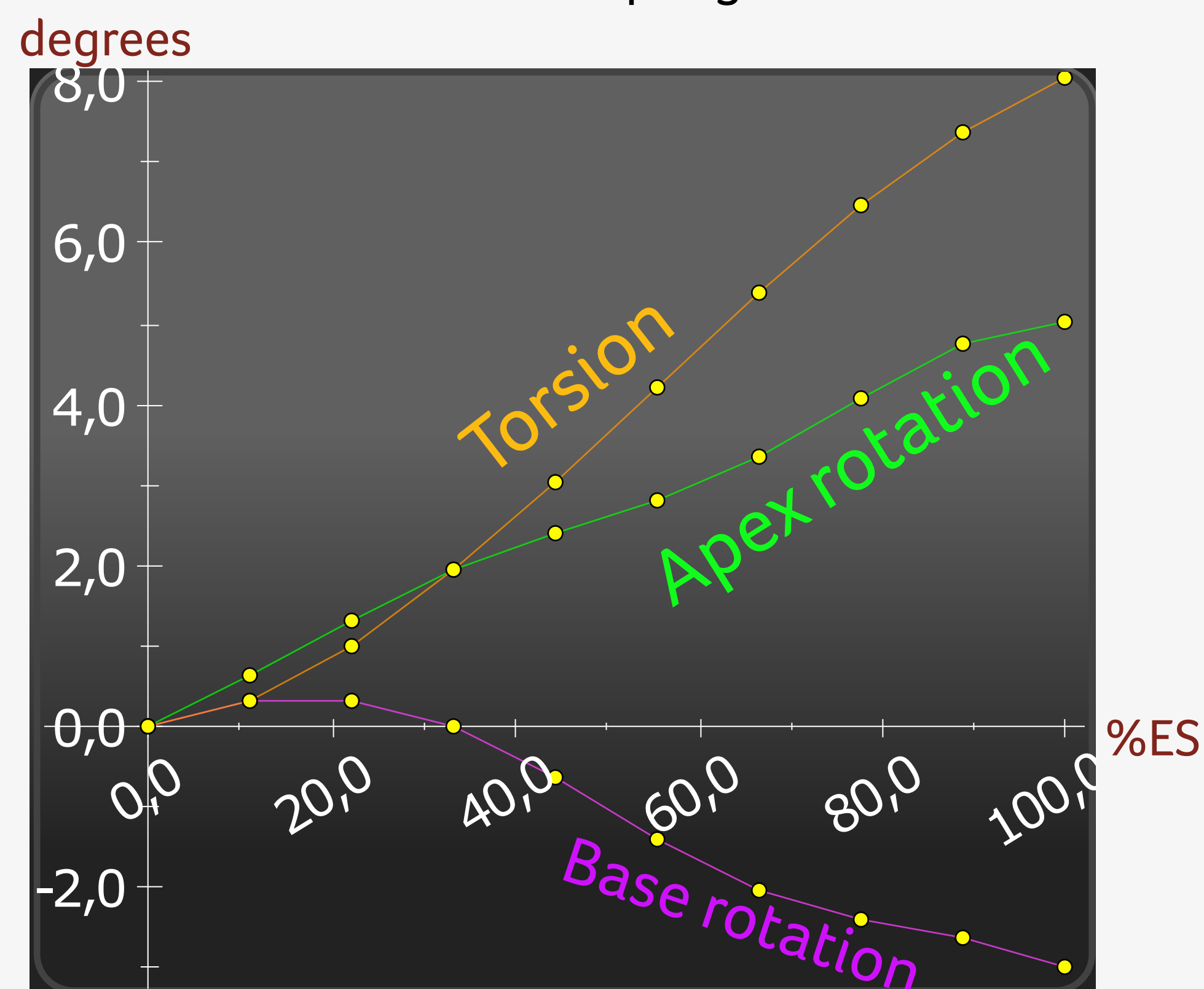
Harmonic Phase Flow

MOTION: HPF ensures robust tracking without overestimating injured areas [2]



Scores

TORSION: difference in basal/mid and apex global rotation in the LV domain



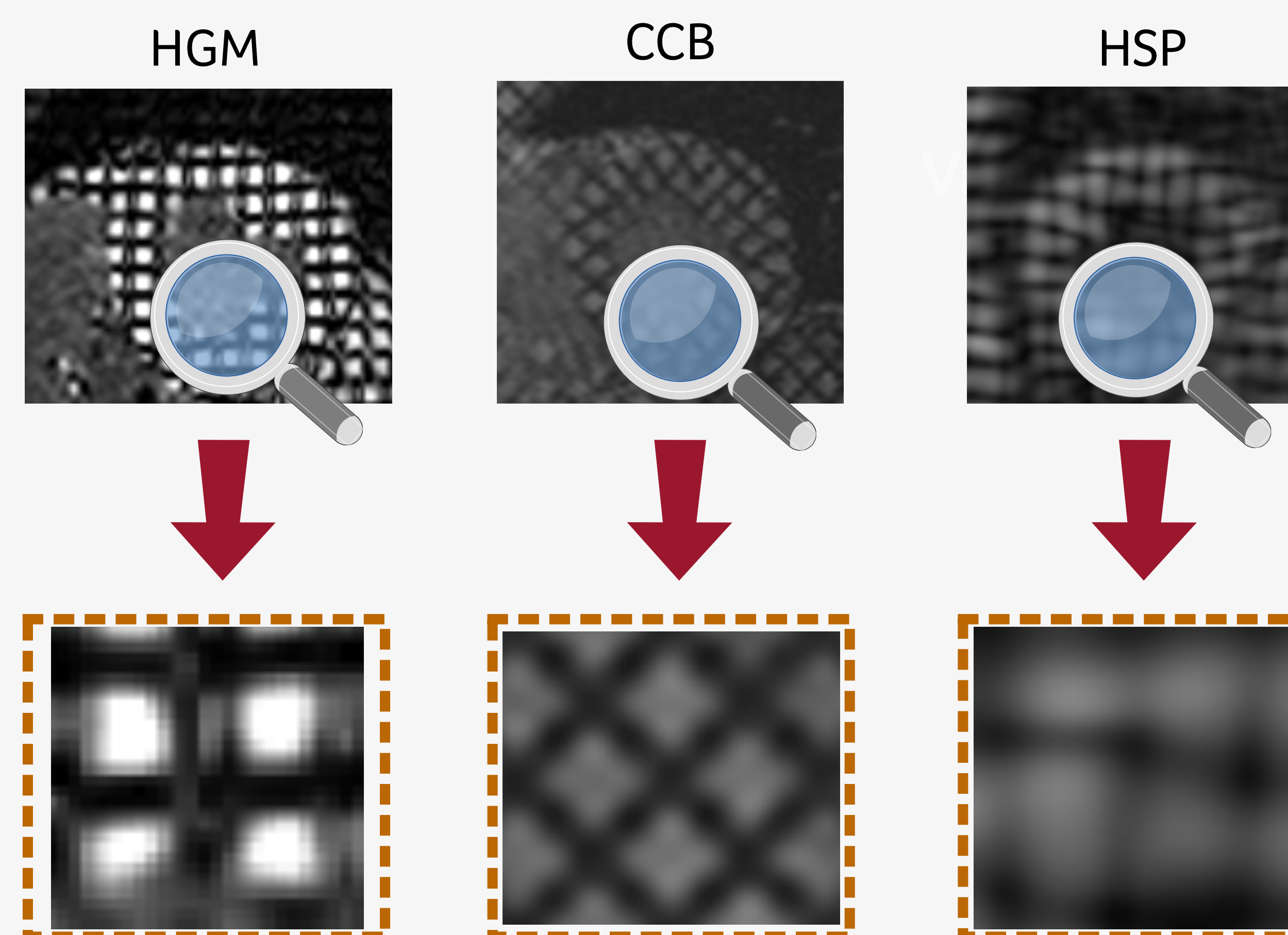
Validation

PLUGIN: deployed at Sant Pau in September 2011

PROTOCOL: different acquisitions, healthy and pathological cases

| Source | # Seqs | Healthy? | Modality | Device |
|--------|--------|----------|----------|---------|
| CCB | 21 | Yes | SPAMM | Siemens |
| HSP | 8 | No | CSPAMM | Philips |
| CCB | 12 | No | SPAMM | Siemens |
| HGM | 7 | No | SPAMM | Philips |

CHALLENGE: heterogeneous image quality



Conclusions and future work

Similar torsion trends for SPAMM acquisitions.
 C-SPAMM sequences too noisy for motion extraction.
 We will focus on quality indicators for improved reliability

References

- [1] Rosset, A., Spadola, L., Ratib, O.: Osirix: an open-source software for navigating in multidimensional dicom images. J Digit Imaging 17(3) (Sep 2004) 205--16
 [2] Carreras, F., Garcia-Barnes, J., Gil, D., et Al: Left ventricular torsion and longitudinal shortening: two fundamental components of myocardial mechanics assessed by tagged cine-mri in normal subjects. Int J Cardiovasc Imaging (Feb 2011)

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