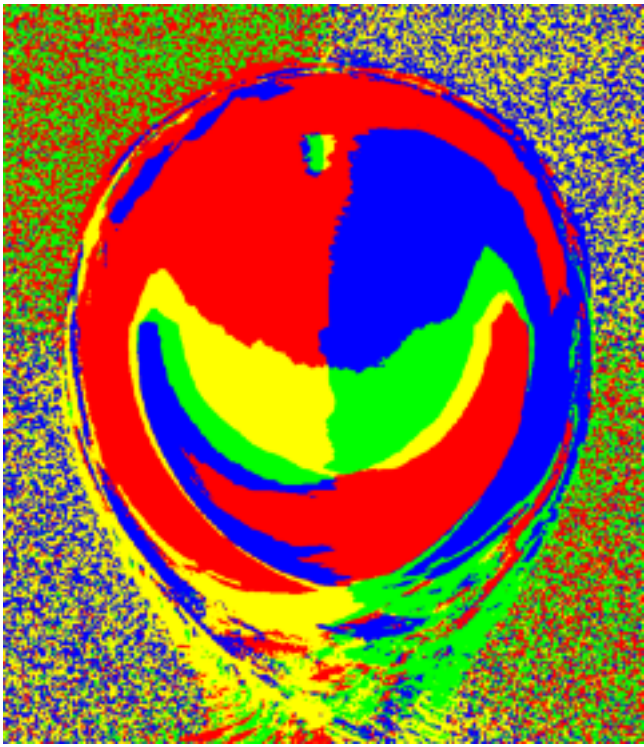
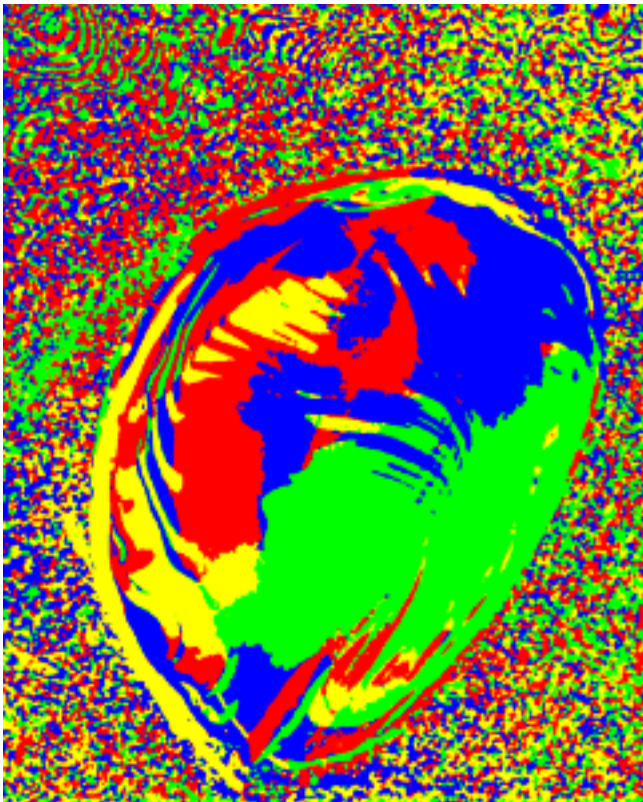
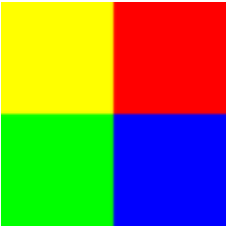


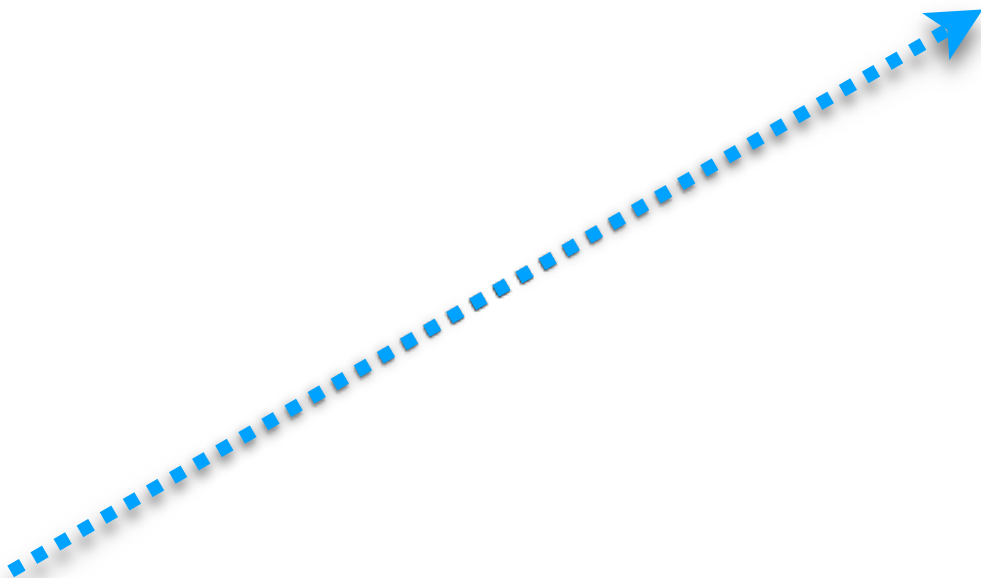
Examples from TD model and reconstructed

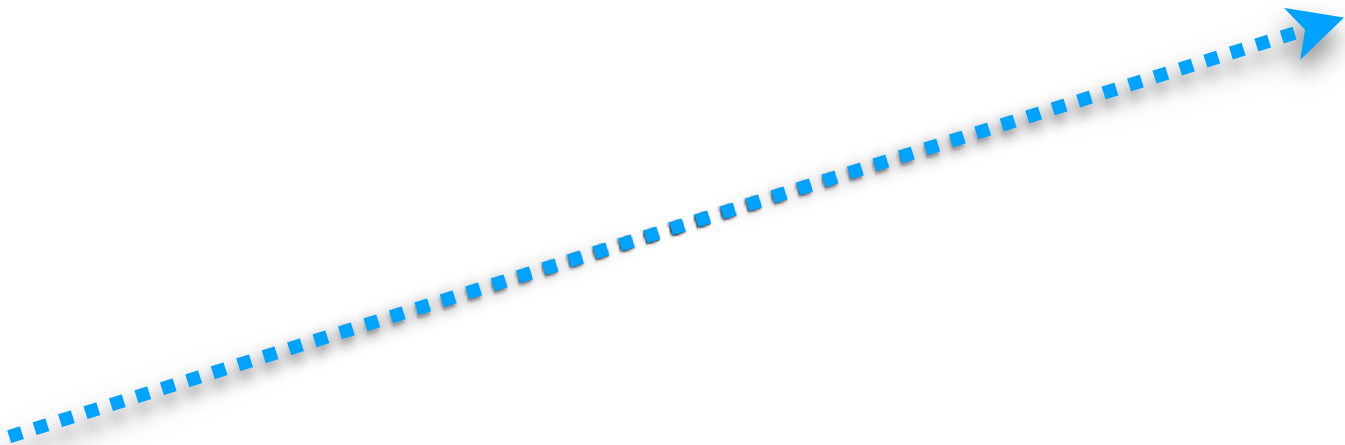
MFR











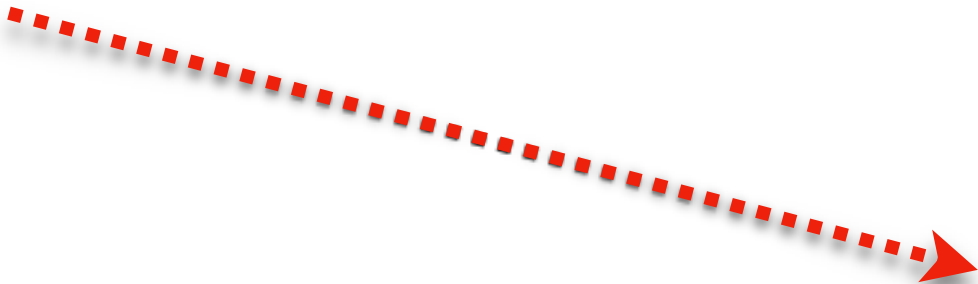


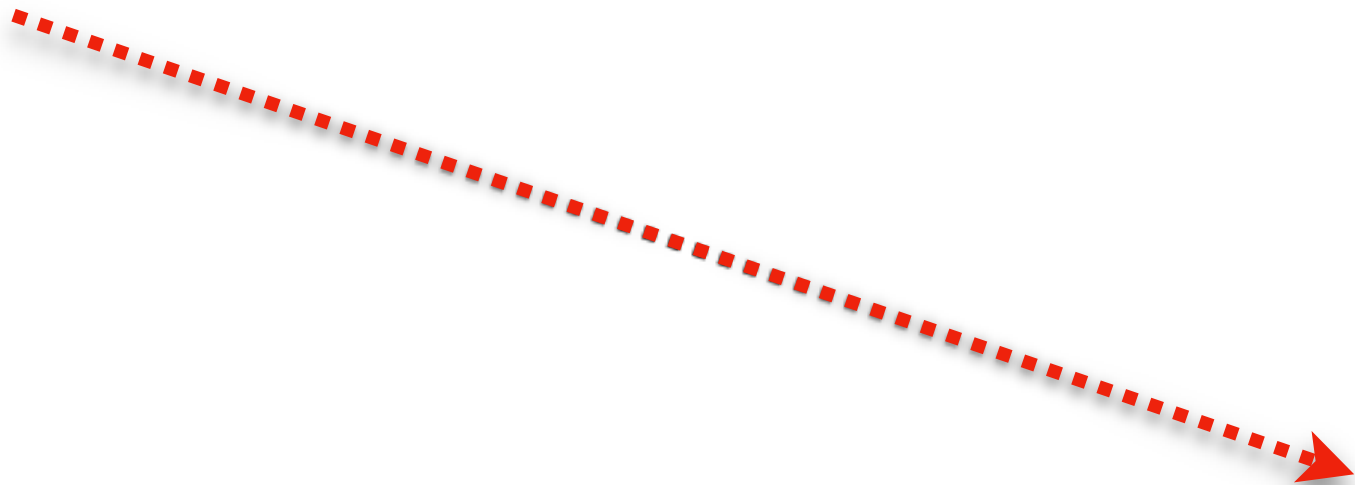










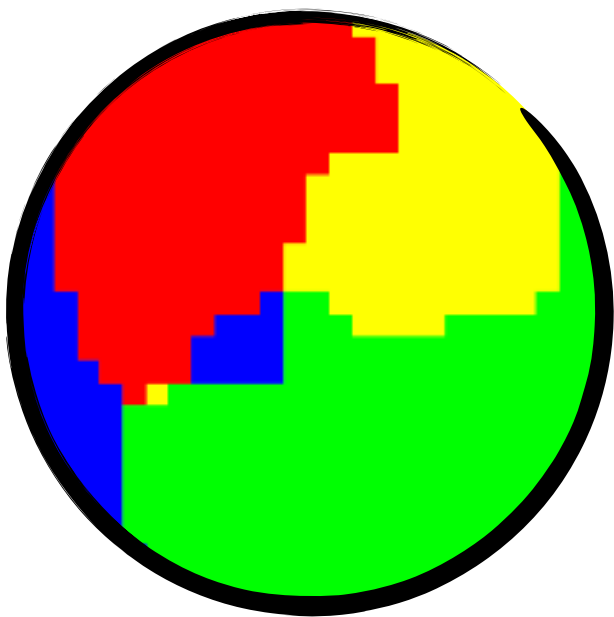


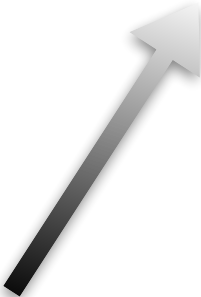
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Reconstructed

MFR



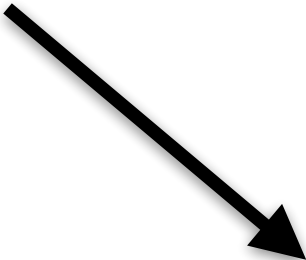




c





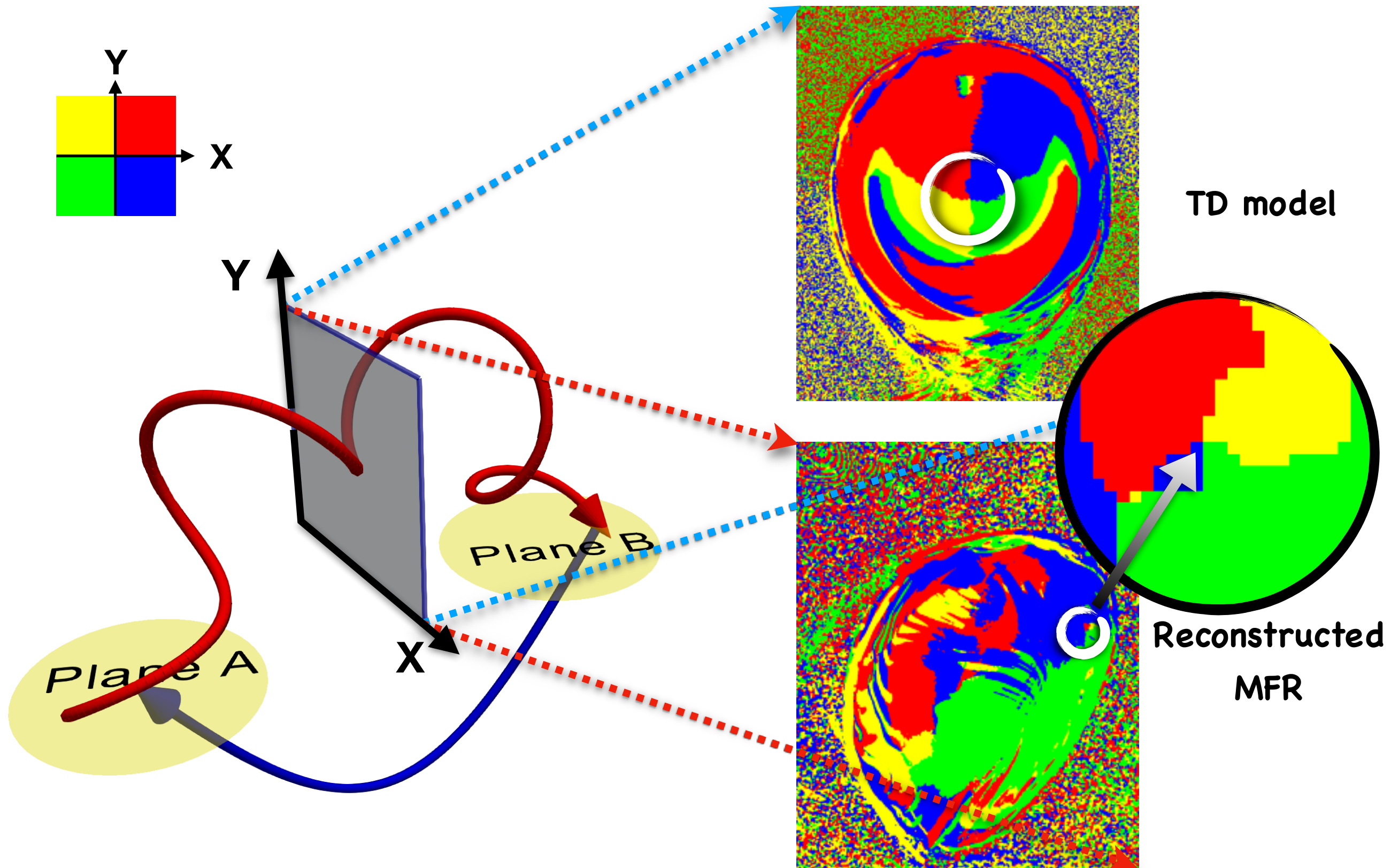






C

Examples from TD model and reconstructed MFR





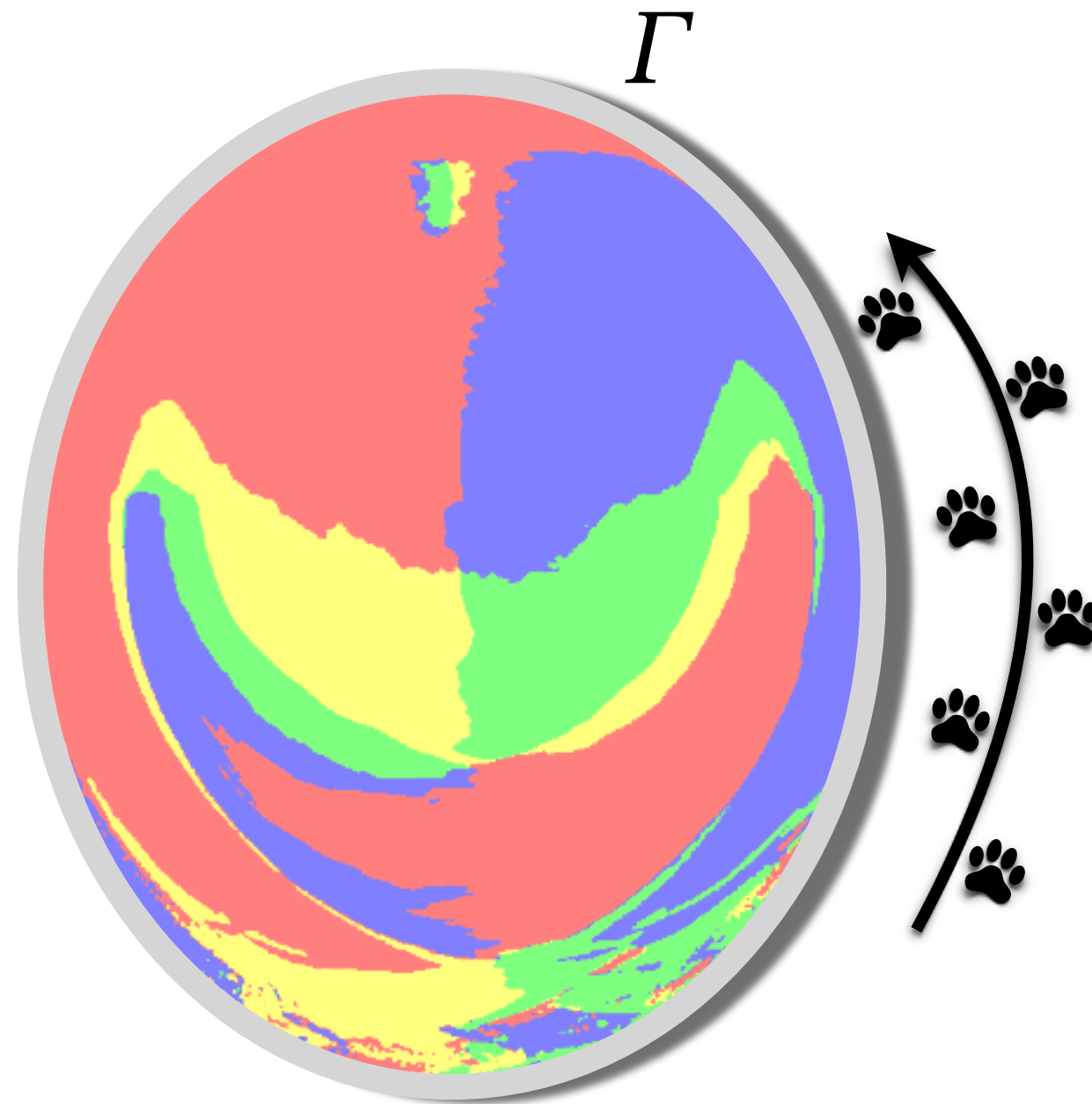
Fix-point Index and Topological Degree of Mapping

The fix-point is the null in the map: $f-I$. We can give an index ± 1 to each fix-point. 1 for the elliptic null and -1 for the hyperbolic null.

Then define the sum of this index inside the computational domain

$$T = \sum_{\text{int}} \text{index}(x_f) .$$

Number T is known as the topological degree or the the Lefschetz number of the self-map.



$$\text{ind}_{x_0} f = \frac{1}{2\pi} \oint_{\Gamma} d\left[\arctan\left(\frac{v_f^y}{v_f^x}\right)\right] = \frac{1}{2\pi} \oint \frac{v_f^x dv_f^y - v_f^y dv_f^x}{v_f^2}$$