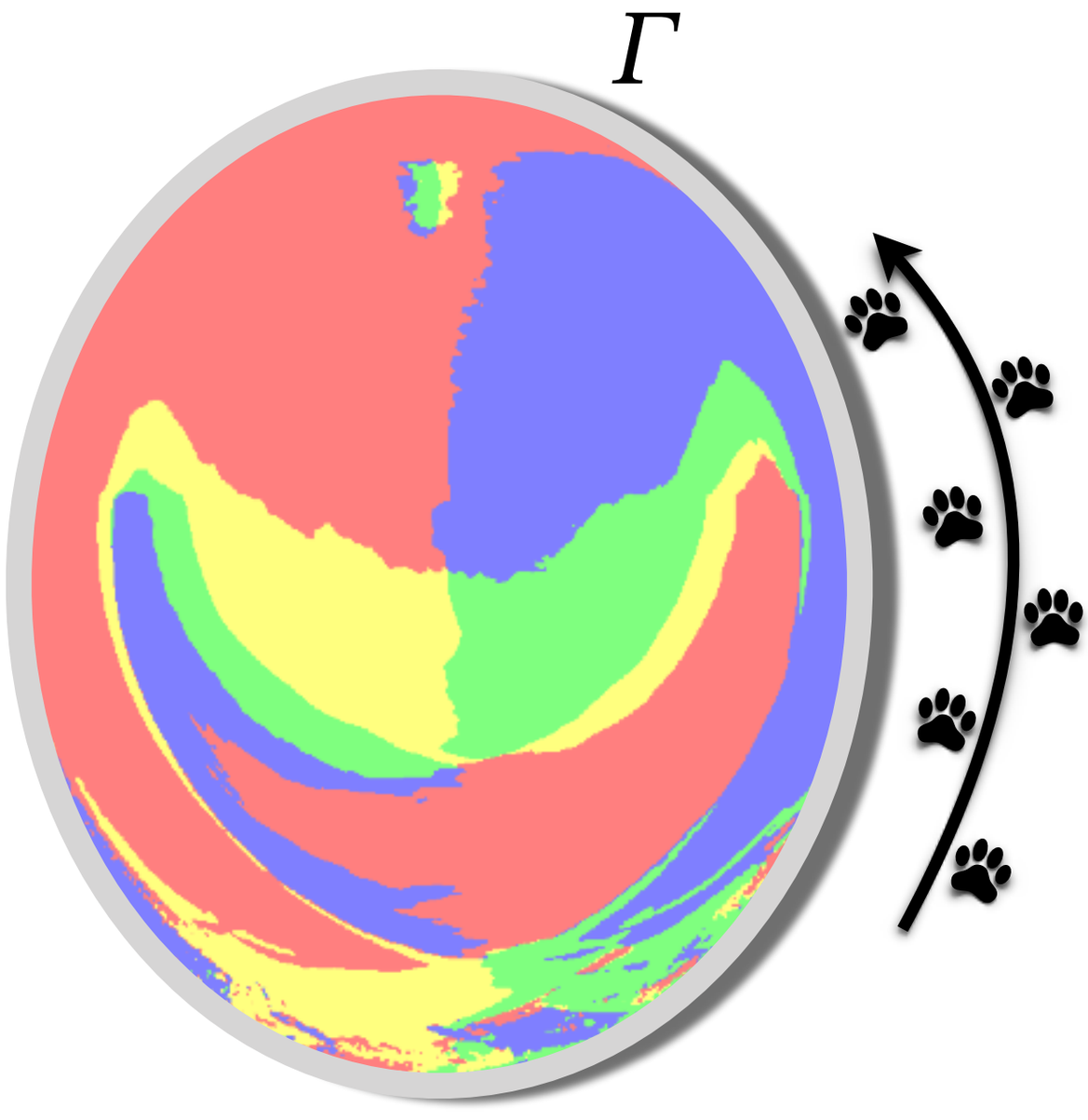
Fix-point Index and Topological Degree of Mapping

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

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

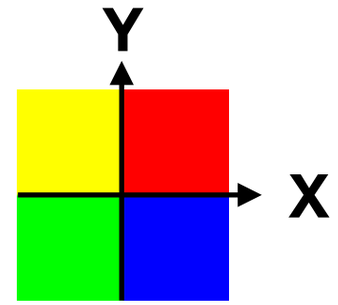
Number T is known as the topological degree or the the Lefschetz number of the self-map.



$$\text{ind}_{\mathbf{x}_0} f = \frac{1}{2\pi} \oint_{\Gamma} \text{d}[\arctan(\frac{v_f^y}{v_f^x})] = \frac{1}{2\pi} \oint \frac{v_f^x \text{d}v_f^y - v_f^y \text{d}v_f^x}{v_f^2}$$

C

Examples from reconstructed MFRs



Time