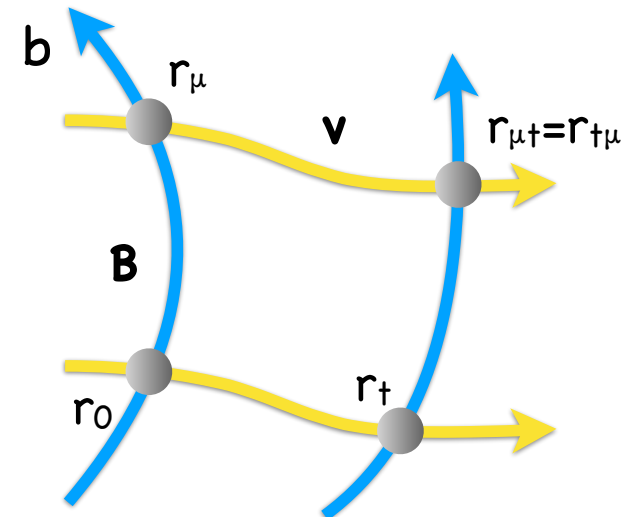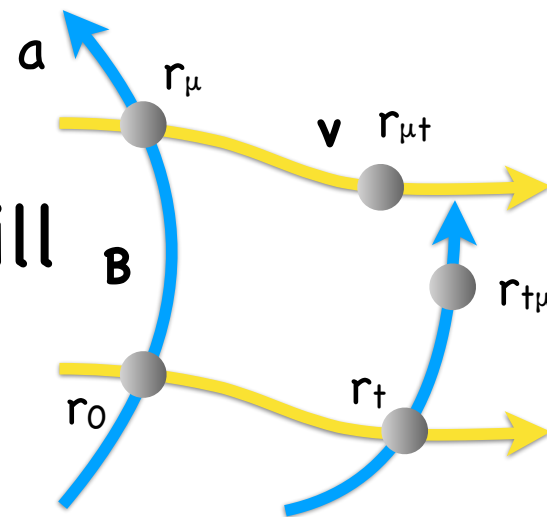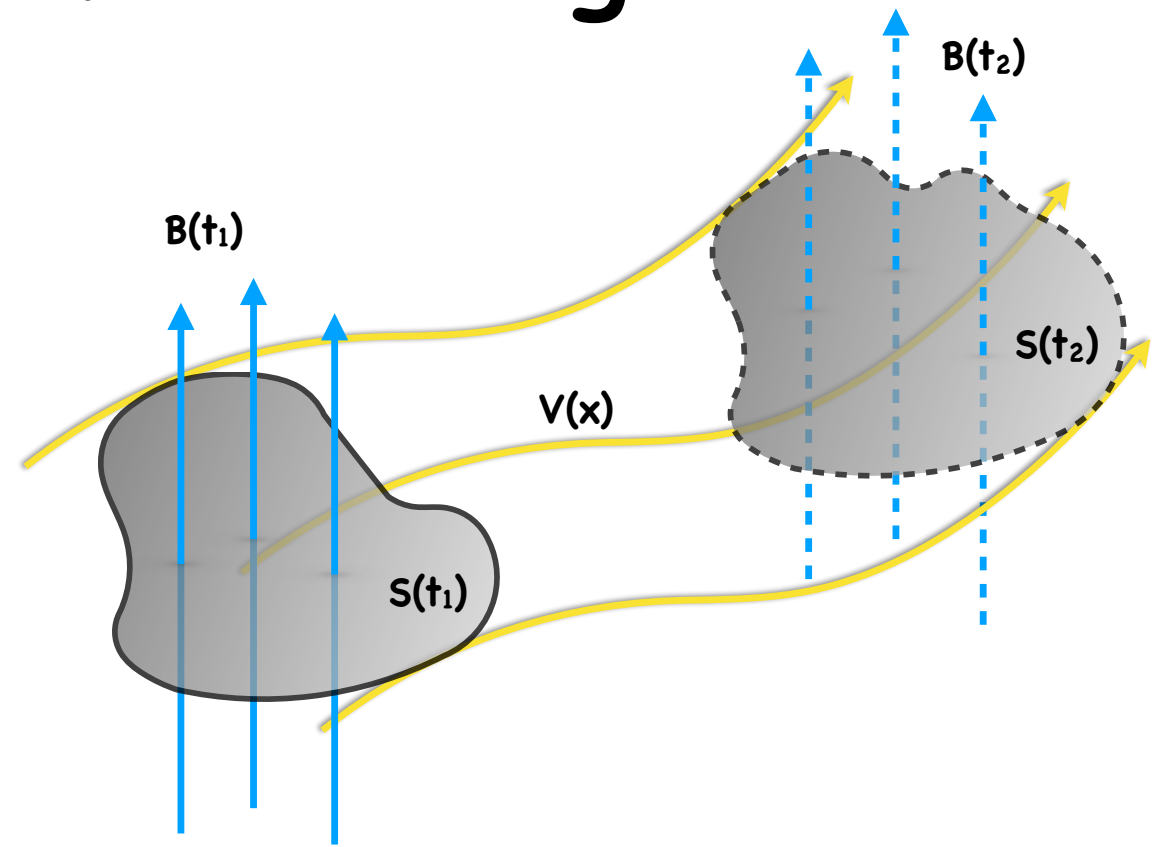# Introduction: Topology of the Magnetic Field

- In the coronal, the resistivity is very small.

- From the ideal induction equation: $\partial_t \mathbf{B} = \mathbf{\nabla} \times (\mathbf{v} \times \mathbf{B}) + \eta \nabla^2 \mathbf{B}$

  —> flux frozen & field line frozen.

- The topology of the B field will be preserved under the ideal evolution.

Introduction: Specific Topology Quantities 1
Topological Boundary

Gradient of the field line mapping f_B: **r** → **R**.

Separatrix: $|\nabla f_B| = \infty$.

Quasi-separatrix: $|\nabla f_B| \gg 1$.

Widely used measurement of the gradient is:

$$Q = \frac{\|\mathbf{J}\|^2}{|\det \mathbf{J}|}$$

,where J is the Jacobian matrix of the map f.

Q=e+1/e

Yang et al. (2015)