Introduction: Summary

B Field Topology

Vector Mapping

Field Line Mapping

Mapping Gradient

Winding (2D)

Linking (2D)

Poincare Index

Positive
Null

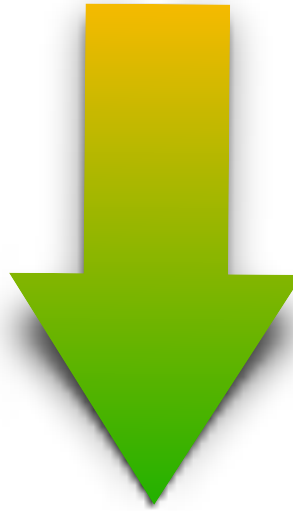
Negative Null

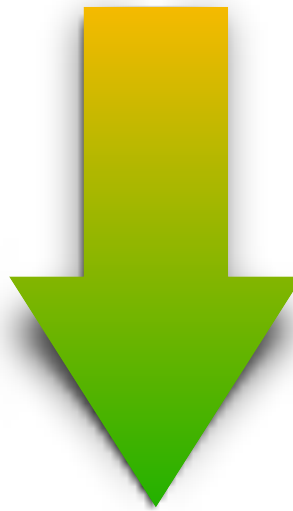
Separatrix

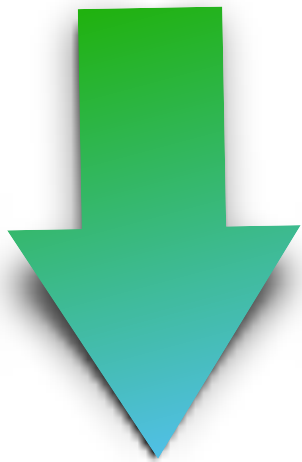
QSL

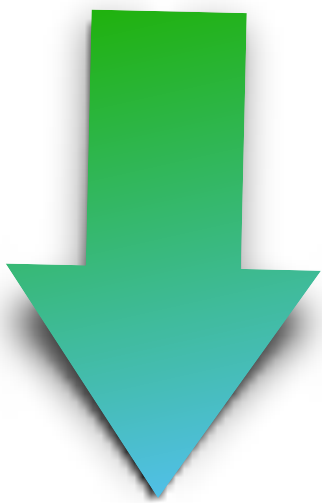
Rotation around fix-point

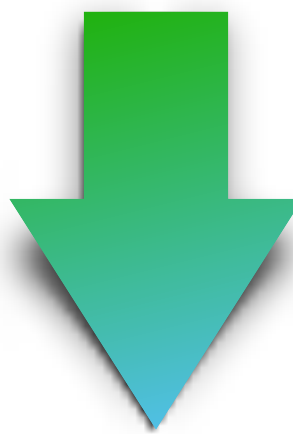
Rotation between two lines

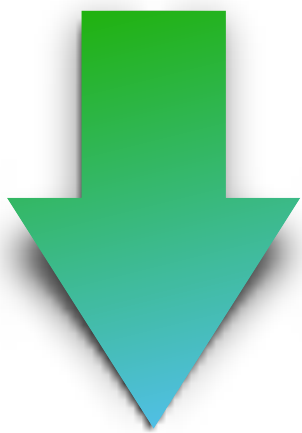


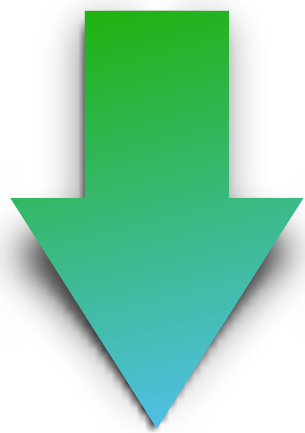






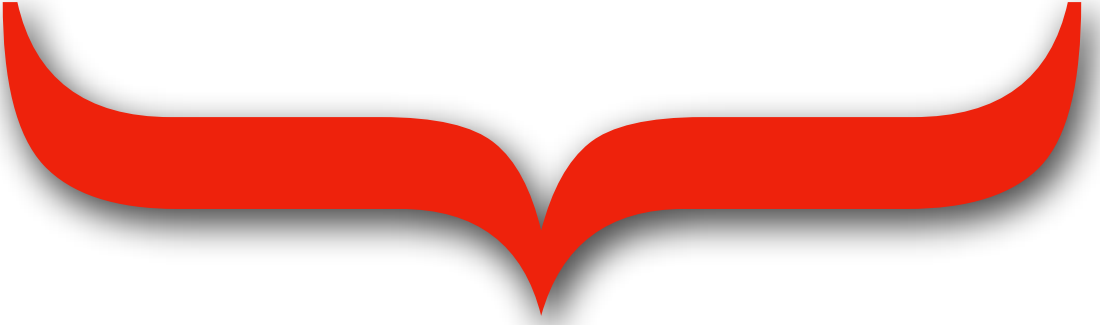






Define Boundary

Calculate the Quantity



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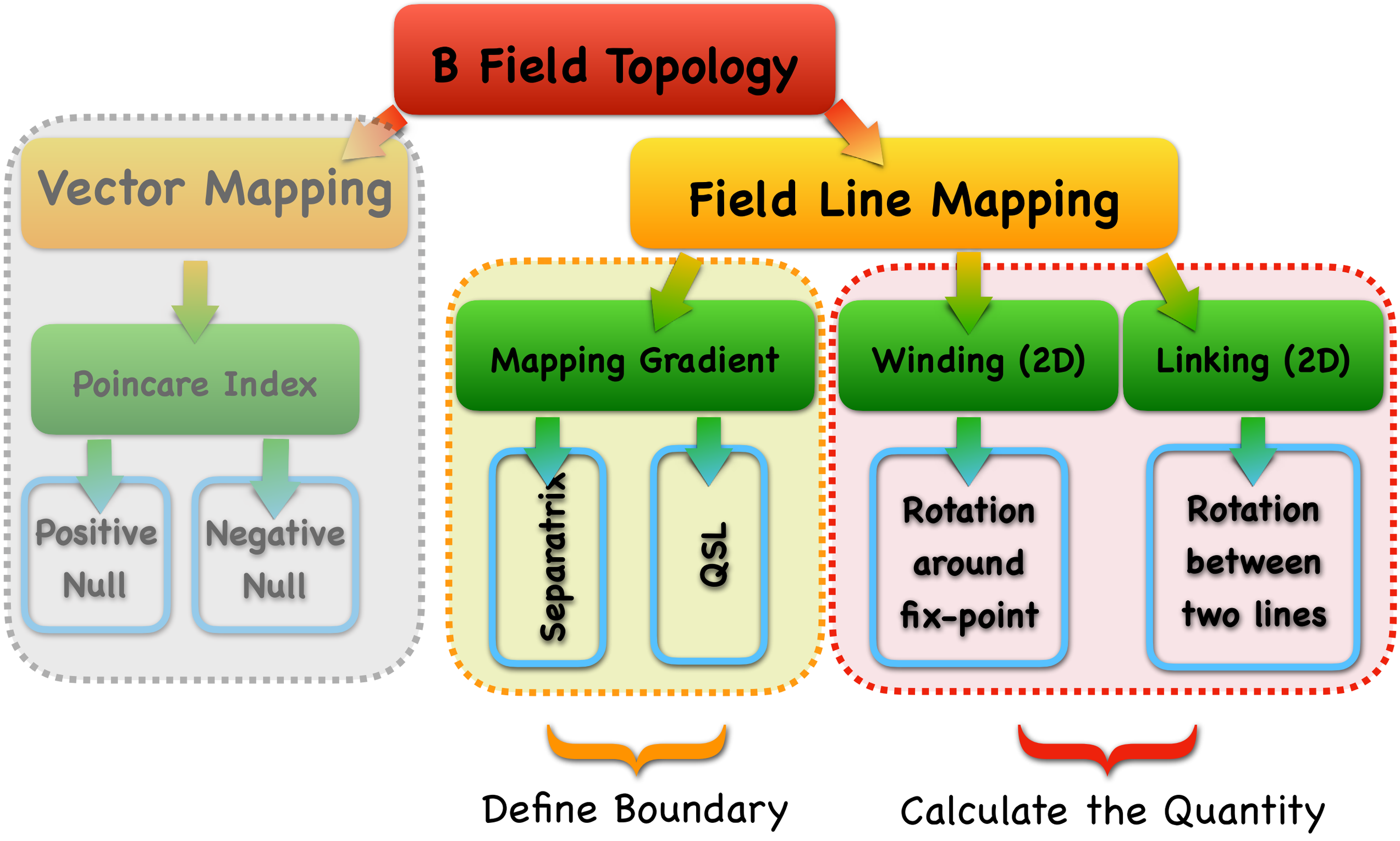


Additive Self-Helicity

As the volume V of the corona is by the B field mapping:

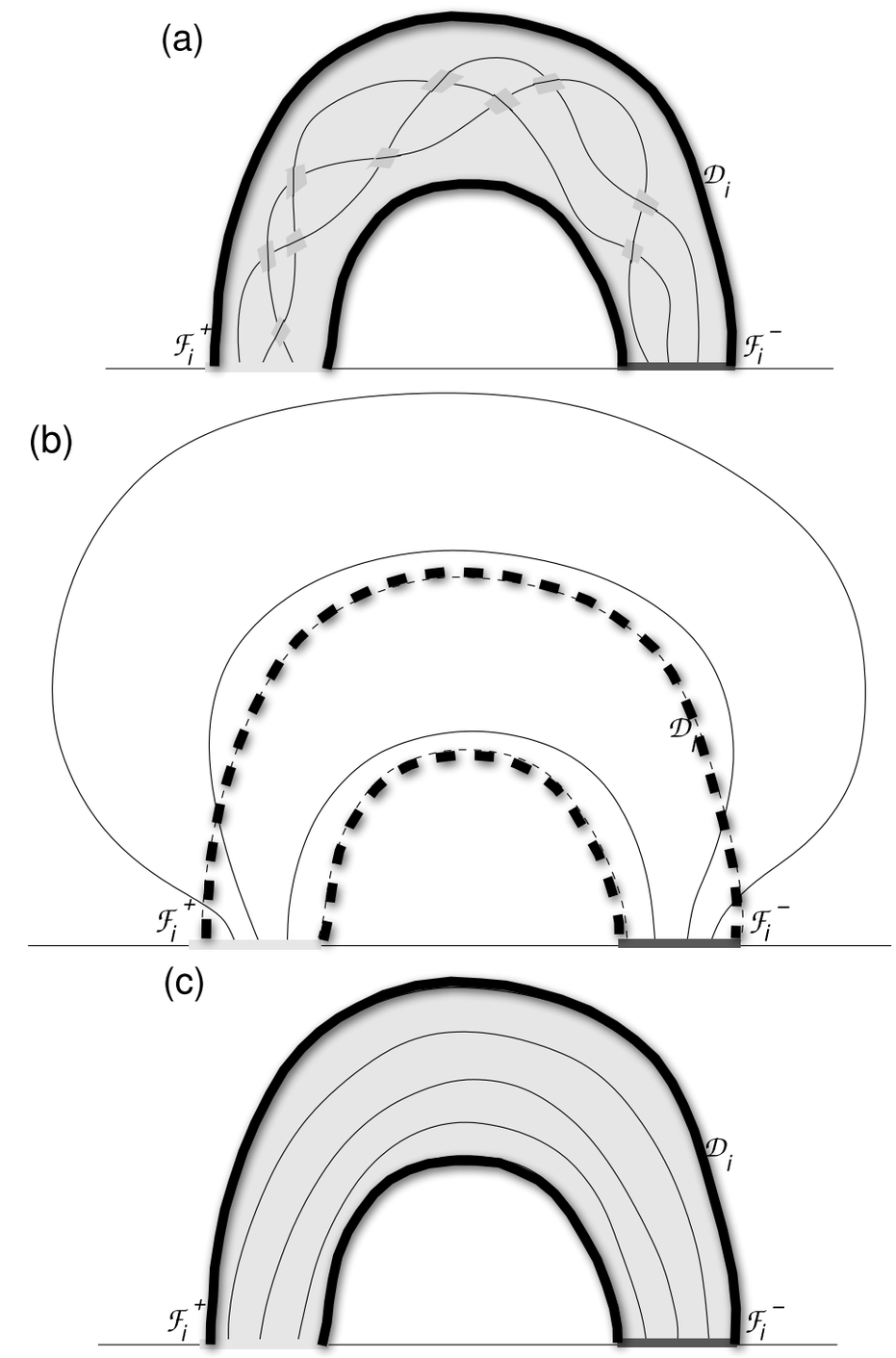
$$V = \cup D_i$$

Boundary condition for the relative helicity:

$$(\mathbf{B}_i - \mathbf{B}_o) \cdot \mathbf{n}\big|_{\partial\Omega} = 0$$

$$\left\{ \begin{array}{l} \mathbf{B}_R = \nabla\Phi \\ \nabla^2\Phi = 0 \end{array} \right\}$$

$$\left\{ \begin{array}{l} \nabla\Phi \cdot \mathbf{n}\big|_{bottom} = \mathrm{B}_z \\ \nabla\Phi \cdot \mathbf{n}\big|_{other} = 0 \end{array} \right\}$$



Longcope & Malanushenkov (2008)