In solutions to $\nabla p = \boldsymbol{j} \times \boldsymbol{B}$ in 3D geometry with nested flux-surfaces and smooth pressure: sheet currents give discontinuous rotational-transform.

[S. Hudson, TH-C-1.1]

1. Pressure-gradients at rational surfaces result in non-physical, $1/x$ current densities, which are non-integrable and result in non-physical, infinite currents.

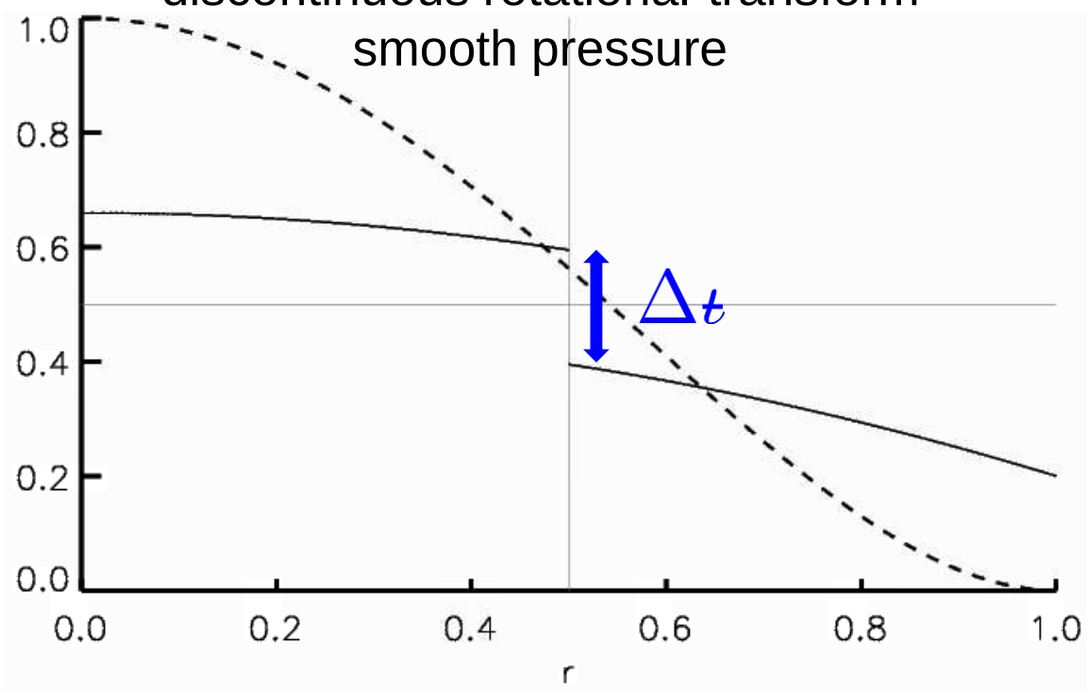
2. δ-function current densities, or "sheet" currents, are an acceptable mathematical idealization of localized currents; give rise to *discontinuous* rotational-transform.

3. Equilibria with discontinuous rotational-transform are illustrated in cylindrical geometry.

4. In ideal-MHD equilibria without rational surfaces, the solutions to $\nabla p = \mathbf{j} \times \mathbf{B}$ are analytic functions of the 3D boundary (and perturbation theory works).

Perturbation amplified by pressure near and inside "resonant" surface

discontinuous rotational-transform
smooth pressure



Penetration and amplification of RMP
inside "rational" surface