1073-53-253 **Jason Parsley*** (parslerj@wfu.edu). *The geometry of the Taylor problem in plasma physics.*

Plasma injected into a toroidal container loses energy rapidly until it reaches a quasi-stable state while its helicity (an average linking number of its field lines) remains essentially constant. J.B. Taylor showed that by also fixing the flux of the field – assumed divergence free and tangent to the boundary – through a cross-sectional disk, the resulting minimal energy field well approximates experimental results. We consider the problem of Taylor on arbitrary subdomains in R^3. We show a solution always exists and investigate the role of geometry on the problem. (Received August 02, 2011)