

2007 Fall Meeting
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[Relaxation of Line-tied Coronal Plasmas to MHD Equilibria with Current Singularities](#)

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A**B**e spontaneous formation of current singularities in line-tied magnetic configurations is a problem of fundamental interest, with important applications to the problem of coronal heating. In this talk, we will discuss some rigorous results which demonstrate that such singular states are formed as an ideally unstable system relaxes to a state of minimum energy subject to the constraints of line-tying. We simulate such systems using the 3D reduced MHD equations and identify criteria that enable us to describe the location and structure of these singularities. It is shown that these sites are qualitatively similar to so-called "quasi-separatrix layers" in the 3D coronal MHD literature. These results provide a rigorous foundation for the nanoflare model proposed by E. N. Parker, widely regarded as a model which identifies a promising mechanism for coronal heating.

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