*Highlights of Astronomy, Vol. 13*
*International Astronomical Union, 2003*
*O. Engvold, ed.*

# Prominence Formation Processes

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**Abstract.** We summarize our attempts simulate the prominence formation model proposed by Martens & Zwaan (2001, ApJ, 558, 872) in which differential rotation drives reconnection between two initially unconnected bipolar active regions to form helical field lines along the polarity inversion line (PIL) between the flux systems.

In Cartesian coronal simulations, we used the ARMS code, an MHD solver with adaptive refinement, to model field evolution resulting from an imposed shear flow on the bottom boundary (to mimic photospheric differential rotation), which contained two bipolar flux concentrations. The boundary fluxes were chosen such that, by symmetry, no coronal lines initially joined the bipolar flux systems. In some runs, the pre-shearing fields were potential, but in others we "spun up" the flux systems prior to shearing (by flows tangent to normal flux contours) to model flux systems possessing helicity at emergence. Work to understand how pre-shearing helicity affects reconnection after shearing onset continues, but we summarize three related conclusions below. In general, prominence-like field topologies did not form by reconnection in "double bipole" configurations, but dipped or helical field lines did form in cases with initial fields with an unphysical bald patch along the PIL. We are currently studying how background fields and/or converging flows modify the field evolution. Reconnection does not readily occur without sufficient topological complexity. Small footpoint displacements induced reconnection in fields with nulls and/or bald patches, but even large footpoint displacements led to little or no reconnection in fields without such topological features. Twisting drives reconnection more strongly than shearing. In contrast to our expectations, we essentially found that shear only weakly drove reconnection, while spin-up readily drove reconnection.

This work was supported by ONR, NASA, and by a grant of computer time from the DOD High Performance Computing Modernization Program at the ERDC MSRC.