

"Non-linear Force Free Modeling of Aug 8 & 10, 2010 Sigmoids via Flux Rope Insertion Method"

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The high spatial resolution of space-based solar telescopes like AIA and Hinode/XRT has allowed us to see fine S-shaped structures in active regions. The collection of such S-shaped loops is known as a sigmoid and are of great interest to solar physics since 68% of coronal mass ejections appear in such regions. In our research, we detail methods of studying sigmoids by using magnetograms to make non-linear force free field models and by comparing these models to the observed loops in X-ray and EUV images. Furthermore, we examine the ability of contour maps of field divergence to study the field topology of sigmoids. From our models, we estimate the free energy stored in the sigmoids. From our field divergence maps, we find features of high divergence also known as quasi-separatrix layers, which can point to probable location for reconnection.