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Coronal brightness evolution and inferred coronal magnetic energy for NOAA AR 10963

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Abstract. We have investigated changes in the properties of the coronal magnetic field in the context of different emission behaviors of coronal loops. Using observations by the Transition Region and Coronal Explorer (TRACE), the Hinode/X-ray Telescope (XRT), and the SoHO/Michelson Doppler Imager (MDI), NOAA active region 10963 has been analyzed in depth as to how different coronal signatures compare to inferred coronal energy build-up. A Magnetic Charge Topology model was used to establish potential magnetic field connectivity of the surface magnetic flux distribution, and a Minimum Current Corona (MCC) model was applied to quantify the energy build-up along separator field lines. The results of the MCC analysis are compared to the evolution of the coronal brightness, comparing areas of steady emission, very transient emission, and temporal patterns of emission which imply coronal cooling.