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Solar EUV emission from the Transition Region and Corona in the context of Coronal Heating[1]

SAMUEL SCHONFELD, Institute for Scientific Research, Boston College

The solar corona is heated to MK temperatures through the conversion of magnetic to thermal energy. The precise mechanism for this energy conversion is unknown and occurs on spatial scales too small to observe with modern instrumentation. Instead, it is studied by modeling the solar atmosphere using different heating prescriptions and comparing modeled solar output with observations. We use EBTEL (Enthalpy-Based Thermal Evolution of Loops) 0D hydrodynamic simulations to investigate the EUV (extreme ultraviolet) emissions from the transition region and corona under a number of heating scenarios. We find that the transition region contributes as much or more emission as the corona, even in channels traditionally considered "coronal", and that the ratio caries diagnostic potential to identify heating properties. We compare these results with observed solar active regions and find broad agreement with the trends in the models. These results highlight the use of narrowband observations and the importance of properly considering the transition region in investigations of coronal heating.

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