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SOLAR-C Mission and Numerical Modeling of Flaring Plasma

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Understanding the solar atmosphere, which connects to the heliosphere via radiation, the solar wind and coronal mass ejections, and energetic particles is pivotal for establishing the conditions for life and habitability in the solar system. SOLAR-C (EUVST) (EUV High-Throughput Spectroscopic Telescope) is designed to comprehensively understand the energy and mass transfer from the solar surface to the solar corona and interplanetary space, and to investigate the elementary processes that take place universally in cosmic plasmas. In order to interpret the observation results obtained by Solar-C and to understand the physics process in more detail, comparison with advanced numerical simulations is considered very important. The SOLAR-C team plans to work systematically to facilitate comparisons with numerical simulations.

Numerical simulation efforts have some issues such as radiative transfer. In this talk we will discuss the modeling results of non-equilibrium ionization during solar flares and discuss the importance of non-equilibrium ionization in the interpretation of SOLAR-C observations. In particular, when estimating physical quantities in the magnetic reconnection region, we have assumed the ionization equilibrium so far. Since SOLAR-C can observe various emission lines at the same time, it is expected that analysis can be performed without assuming ionization equilibrium. We believe that these models are useful not only for interpreting solar observations, but also for interpreting other astronomical remote sensing observations.

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