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Future high-resolution observations of the low solar atmosphere from space

Monday, February 27, 2023 10:12 AM (20 minutes)

In this talk I will provide a brief overview of the upcoming solar missions focused on the Sun's corona: MUSE and Solar-C/EUVST, scheduled for launch in 2027 and 2028, respectively. The Multi-slit Solar Explorer (MUSE) is a NASA MIDEX mission, composed of a multi-slit EUV spectrograph (in three spectral bands around 171Å, 284Å, and 108Å) and an EUV context imager (in two passbands around 195Å and 304Å). MUSE will provide spectral and imaging diagnostics of the solar corona at high spatial (~0.5 arcseconds), and temporal resolution (0.5 seconds). By obtaining spectra in 4 bright EUV lines covering a wide range of transition region and coronal temperatures along 37 slits simultaneously, MUSE will be able to “freeze” (at a cadence as short as 10 seconds) with a spectroscopic raster the evolution of the dynamic coronal plasma over a wide range of spatial scales. Solar-C is a JAXA-led international mission with the EUV High-throughput Spectroscopic Telescope (EUVST) as its main payload. EUVST is a high-resolution (0.4 arcsecond), high-cadence (0.5s) single-slit spectrograph that includes multiple spectral passbands in the EUV and FUV, providing temperature coverage from the chromosphere to the flaring corona without any significant gaps. EUVST includes slit-jaw imaging in the photosphere, low chromosphere and upper chromosphere. I will describe the strong synergy between these missions and provide some examples of how the constraints on the properties of the solar atmosphere from these instruments can discriminate between predictions from various current numerical models for coronal heating, solar flares, and coronal mass ejections.

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