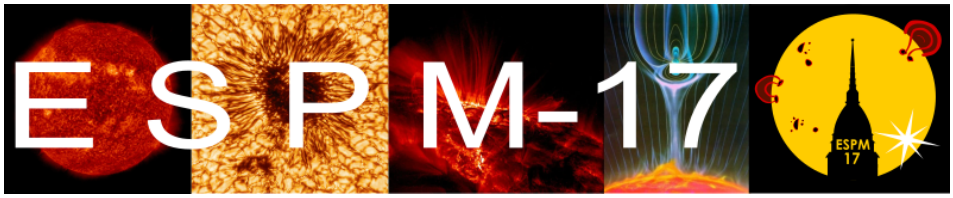

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UV observations of small- and intermediate-scale enery release phenomena in the solar atmosphere

We present observations of small- to intermediate-scale energy release events occurring in the solar atmosphere, investigated using multiwavelength, multi-instrument high-resolution data. Ultraviolet (UV) observations acquired by satellites, along with complementary simultaneous spectro-polarimetric measurements by ground-based telescopes, allow us to shed light on the dynamic interplay between plasma and magnetic fields from the photosphere up to the transition region and corona.

We use data from observing campaigns in 2016, involving the SST telescope in La Palma, and 2023. The latter was a 10-day campaign conducted in August 2023 at the GREGOR telescope in Tenerife, using the High-resolution Fast Imager (HiFI) and GREGOR Infrared Spectrograph (GRIS) in spectropolarimetric mode. Both campaigns were coordinated with IRIS and Hinode observations. IRIS UV observations consist of dense rasters (0.32" slit) and simultaneous slit-jaw images. Continuous coverage by SDO data complements these observations.

IRIS detected a series of small reconnection events and captured a footpoint of a C-class flare. We conducted an initial examination of the evolution of these events using photospheric and chromospheric spectropolarimetric data. These data were investigated using inversion codes to derive the magnetic configuration in the lower atmosphere.

Our analysis suggests that the interplay between emerging flux and other flux systems triggers small- to intermediate-scale energetic events. These results illustrate how magnetic reconnection can explain the occurrence of energy release phenomena. Notably, these science cases pave the way for advancements that will be available with the future MUSE and SOLAR-C missions, together with coordinated spectropolarimetric observations by the European Solar Telescope.

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Track Classification: Fundamental mechanisms of solar plasmas: magnetic reconnection, waves, radiation and particle acceleration