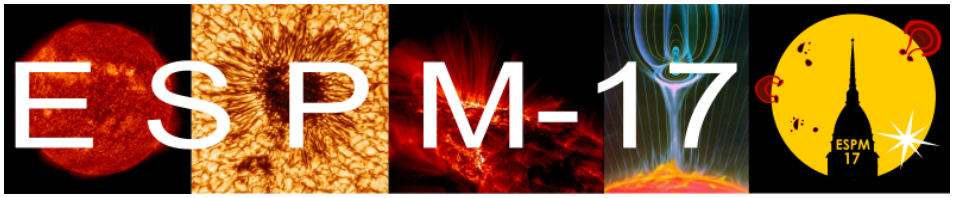

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Statistical study of NUV continuum enhancement in Solar flares

So-called White Light Flares (WLFs) show enhancements in the visible spectrum with respect to the solar black-body curve. The Interface Region Imaging Spectrograph (IRIS) has found enhancements in the NUV spectral region, indicating an enhanced Balmer continuum. Statistical studies using imaging instruments have shown such enhancements to occur commonly, but what causes these enhancements is still a matter of debate, despite significant efforts in the field. It is believed that these enhancements are either a result of the electron beams or of the "backwarming"process, which transfers energy into the lower layers of the solar atmosphere. Although simulations of individual flare events may offer a valuable understanding of particle energy and penetration depth, the examination of numerous flares can provide better constraints and probe the energy transfer process.

We perform a statistical study using IRIS NUV spectral data to classify the occurrence of Balmer continuum enhancements. We use Gaussian process regression (GPR) to detect continuum intensities that are more than 4 sigma above the mean level. These "outliers" are then marked as NUV continuum enhancements. Our findings indicate that most of the enhanced pixels are located on the flare ribbon. Higher energy flares exhibit greater enhancement and a larger enhancement area. Our next step will be to simulate the NUV spectra of flares using the RH code (Uitenbroek 2001) and to provide constraints on the energy transport mechanism for WLFs.

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