Title: Exploring the Eruption Potential from Solar Flares Measured by the Extreme Ultraviolet Variability Experiment (EVE) on the Solar Dynamics Observatory (SDO)

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Abstract:

The Solar Dynamics Observatory (SDO) satellite was launched in Feb 2010 with a mission goal to help understand the solar influence on earth and humanity. The SDO satellite consists of three different instruments: one of them being the Extreme Ultraviolet Variability Explorer (EVE), which measures the extreme ultraviolet irradiance of emission lines produced from solar flares with wavelengths between 0.1-105 nm. Two channels on EVE are Multiple EUV Grating Spectrograph (MEGS)-A at 5-35 nm and MEGS-B at 35-105 nm, both are at 0.1 nm resolution. A theory was proposed that *eruptive* flares would have a larger time differences between the peaks of emission lines in the impulsive phase (usually the first peak) and gradual phase (usually the second peak) of a solar flare, whereas *confined* flares would have a shorter time difference. By using He II (30.4 nm, log(T)=4.7) as the impulsive phase emission line and Fe XVIII (9.39 nm, log(T)=6.8) as the gradual phase emission line from MEGS-A, it was found that this theory is not entirely correct. What was found was that for most flares, the magnitude of the irradiance determines whether a flare is confined or eruptive, while the time difference was not as conclusive. The original theory was expected to be used to predict eruptive flares in real time from irradiance data, although the time difference does not help, the magnitude of the irradiance can play an important role in quantifying the probability of an eruption.