Progress in Resolving X-Class Flare E-Region Issues

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Four X-class flares are observed by SDO-EVE in early May 2013 all within a three day period. The ionospheric E-region impact of all four flares were also observed by the Poker Flat Incoherent Scatter Radar (PFISR). During this extended three day period the PFISR observations also provide a non-flare baseline of the E-regions response to the quiet solar irradiance. Thus there is sufficient ionospheric information to provide ground-truth for ionospheric E-region modeling. We will report to the status of modeling the quiet time contrasted to the flare periods. In so doing we will identify key issues associated with modeling of the ionization especially the Auger process as well as handling the secondary ionization processes associated with energetic photo electrons. These results will be put in context of today's best practices for modeling ionospheric E-region impacts of X-class flares.