Master-Thesis: Chemical effects of solar particle events in the middle atmosphere

Solar flares and coronal mass ejections give rise to enhanced fluxes of energetic charged particles (mainly protons and electrons) from the Sun. These particles can enter the Earth atmosphere in the polar regions where they are not deflected by the geomagnetic field. The precipitating particles cause ionization and dissociation of air molecules, and affect the atmospheric chemistry.
The objective of this thesis work is to investigate the impact of large solar energetic particle events on the chemistry of the stratosphere and mesosphere. Of particular interest are the effects on nitrogen and hydrogen radicals, ozone, and chlorine species. Measurement data from different satellite instruments will be analyzed, and compared to one-dimensional atmospheric model simulations in order to improve our understanding of solar particle events in the polar atmosphere.
There is no prior knowledge required in the area of middle atmospheric chemistry or solar particle events. The master candidate will be closely guided by the supervisor. Willingness to do some computer programming is required.

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