Title: The effects of precipitating solar energetic protons in the Martian Atmosphere

Student: Paige Campbell
Mentor: Xiaohua Fang

Abstract: The effects of particle precipitation events on Earth's atmosphere have been studied since the 1960's and are fairly well-known. The most significant effects we see are the increase in odd nitrogen, which leads to a decrease in amount of ozone molecules. Many different kinds of phenomena can cause particle precipitation, including the solar wind, coronal mass ejections, and galactic cosmic rays. In this study, we take analysis techniques previously used to study how deep precipitating protons from solar proton events with energies from 1 MeV to 1,000's of KeV penetrate the atmosphere and apply them to the Martian atmosphere. The effects are expected to be different due to the weak Martian magnetic field and thin atmosphere.