



## **Field-aligned electrostatic potential differences on the Martian night side**

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Field-aligned electrostatic potential differences on the Martian night side above  $\sim 170$  km can be inferred with the aid of a kinetic electron transport model and in a statistical sense, by energy-dependent angular shifts in electron loss cones measured in Mars orbit. Potentials between 170 km and 400 km derived from pitch angle distributions measured by the Mars Global Surveyor (MGS) Magnetometer/ Electron Reflectometer experiment (MAG/ER) at 2 a.m. local time are typically small ( $-10$  V to  $10$  V) but can reach magnitudes of  $>100$  V. Geographically, the strongest negative potential differences (with mean values up to  $-50$  V) are preferentially observed at the boundaries between open and closed strong magnetic field regions, while positive potential differences are preferentially observed further from open field lines. These characteristics may reflect current systems closing at high altitude through cross-tail currents and at low altitude in the conducting night side ionosphere. We will present a synthesis of potentials derived from pitch angle distributions measured by both MGS MAG/ER as mentioned above, and by the MAVEN Solar Wind Electron Analyzer (SWEA) collected at a range of local times and altitudes.