

Lunar Environment Theme - Figures

PLACEHOLDERS

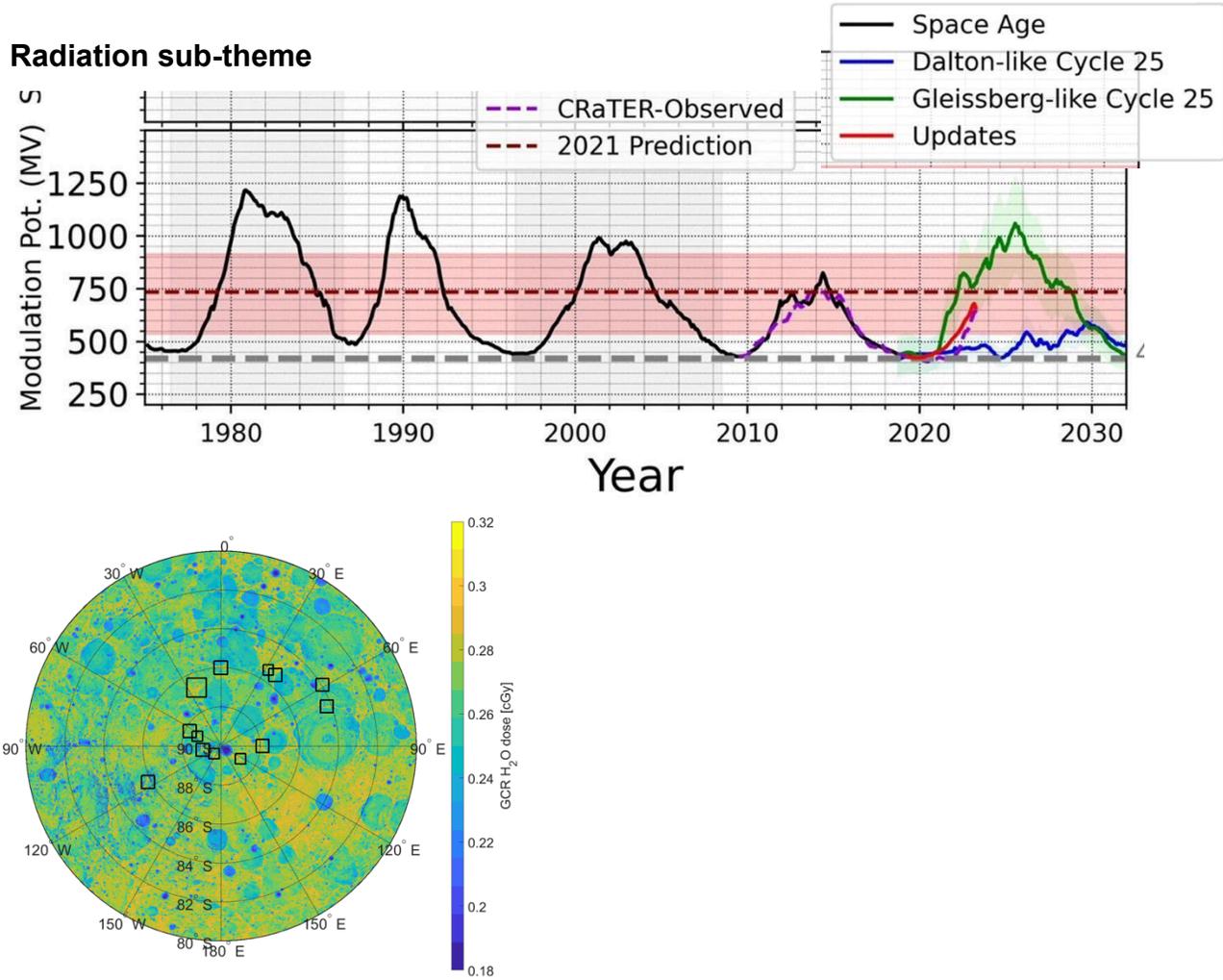


Figure LE1: (top panel) CRaTER will measure the lunar radiation environment during the peak and declining phase of Solar Cycle 25. Each solar cycle is different and unpredictable with the Sun's magnetic field switching polarity between even and odd cycles, which affects the radiation environment at the Moon from both GCRs and SEPs. (bottom panel) The radiation environment measured by CRaTER in orbit can be mapped to the lunar surface using LOLA DEMs. Shown is a map of the predicted 30-day dose from GCRs to a space suited astronaut around the lunar South Pole. Black squares mark the original Artemis III candidate landing sites.

Ionosphere sub-theme

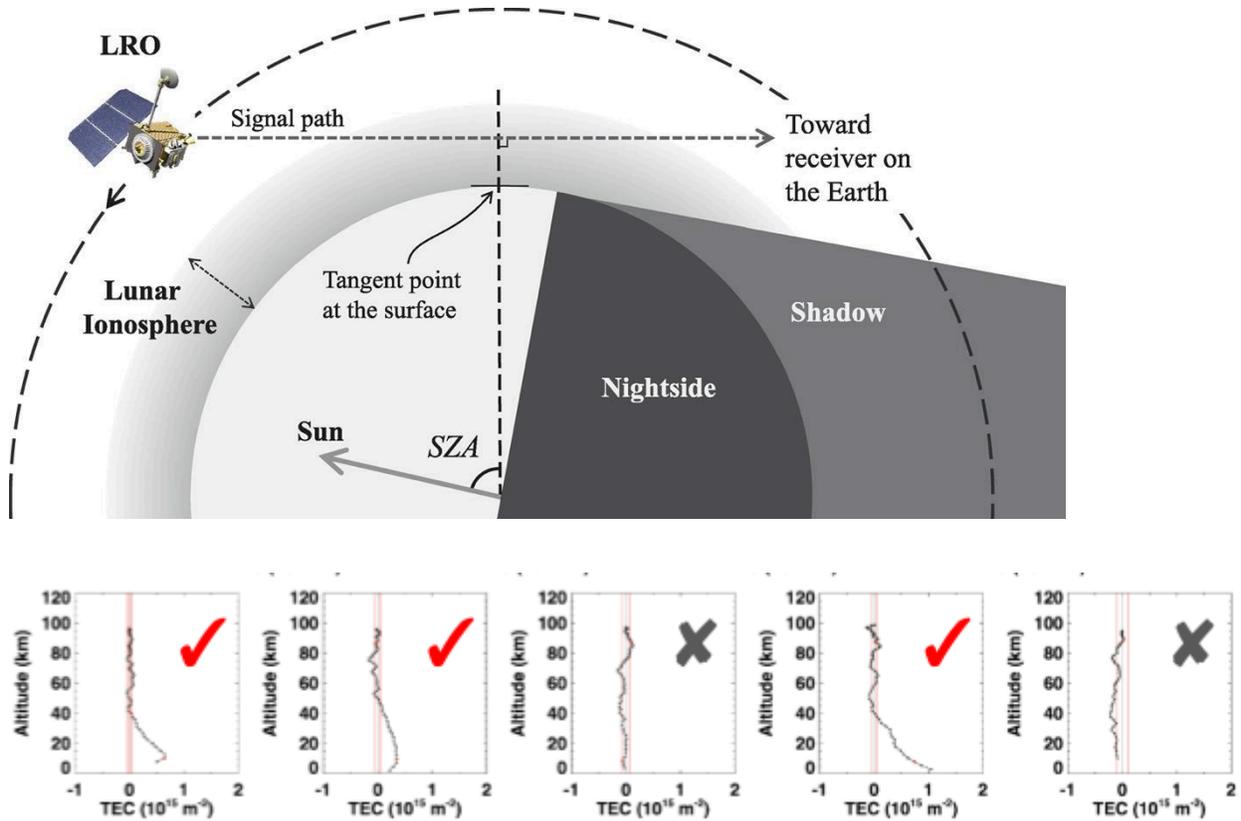


Figure LE2: (top panel) The successful LRO radio occultation test campaign during ESM5 used this observing geometry. As LRO orbited behind the Moon, the dispersive properties of the radio signals transmitted to the ground station on Earth were used to search for evidence of a dense lunar ionosphere. (bottom panel) A demonstration that LRO was not only capable of detecting the dense lunar ionosphere with a high level of certainty, but that it was able to discover a temporal variability on two-hour timescales. Each of these profiles from consecutive orbits shows electron column concentrations as a function of altitude above the lunar limb. Red ticks indicate detections of a dense lunar ionosphere and gray crosses non-detections.

Exosphere sub-theme

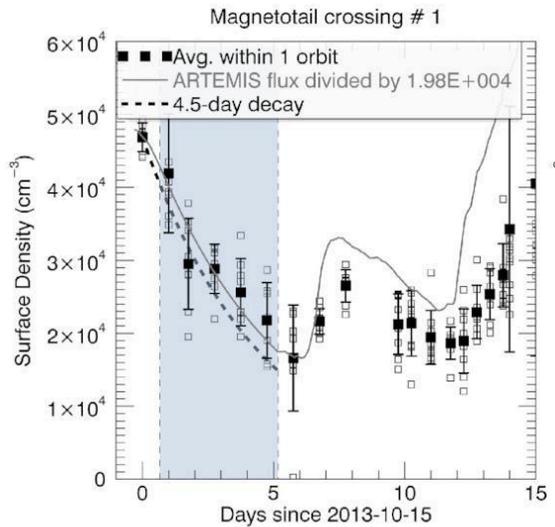


Figure LE3: This shows the ability of LAMP to track the variability of helium (black squares), a volatile exospheric species, during an interval where the Moon passed through the Earth's magnetotail (gray shaded area). By comparing with ARTEMIS measurements of solar wind alpha particles (thin line), it is possible to infer helium escape rates, redistribution and outgassing from the lunar interior. Higher LAMP detector voltages during ESM6 will enable even more sensitive measurements.