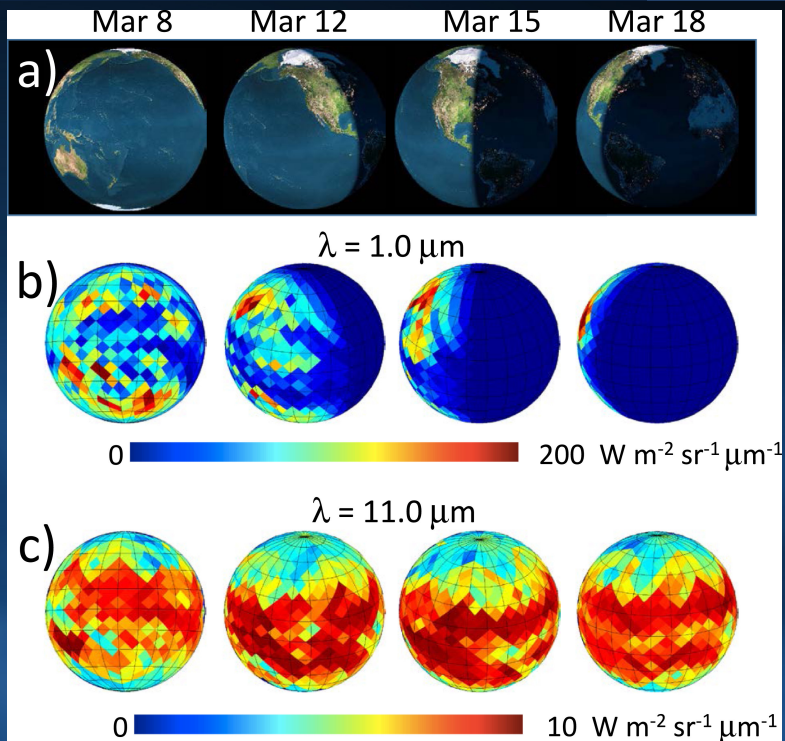


Model Illuminates Radiation Environment in Lunar PSRs



SPATIAL DISTRIBUTION OF EARTH'S RADIANCE OBSERVED FROM THE MOON | Synthetic model observations from four days in March 2008 at 0 HR UT. (A) Top panel shows artificially colored cloud-free context maps showing relative land and ocean coverage. (B) Middle panel displays $\lambda = 1.0 \mu\text{m}$ brightness maps showing surface features such as continents, cloudy regions, and glint near crescent phase. (C) Bottom panel displays $\lambda = 11.0 \mu\text{m}$ thermal maps revealing thermal (heat) emission from land and oceans at low and mid-latitudes.

Modeling Earthshine provides insight into the stability and detectability of volatiles in lunar polar regions—with implications for future robotic and human exploration.

- While permanently shadowed regions (PSRs) at the lunar poles are shielded from direct sunlight, they are not shielded from radiation reflected or emitted by Earth, or “Earthshine”. The radiation environment in Lunar PSRs can be modeled as a function of Earth-Moon geometry and rotation.
- PSRs are repositories for volatiles like water ice that may be characterized or exploited by future robotic or human explorers.
- Earthshine has the potential to enable the scientific investigation and exploration of conditions in PSRs, and these results could be used to inform the PSR light environments in support of these future missions.