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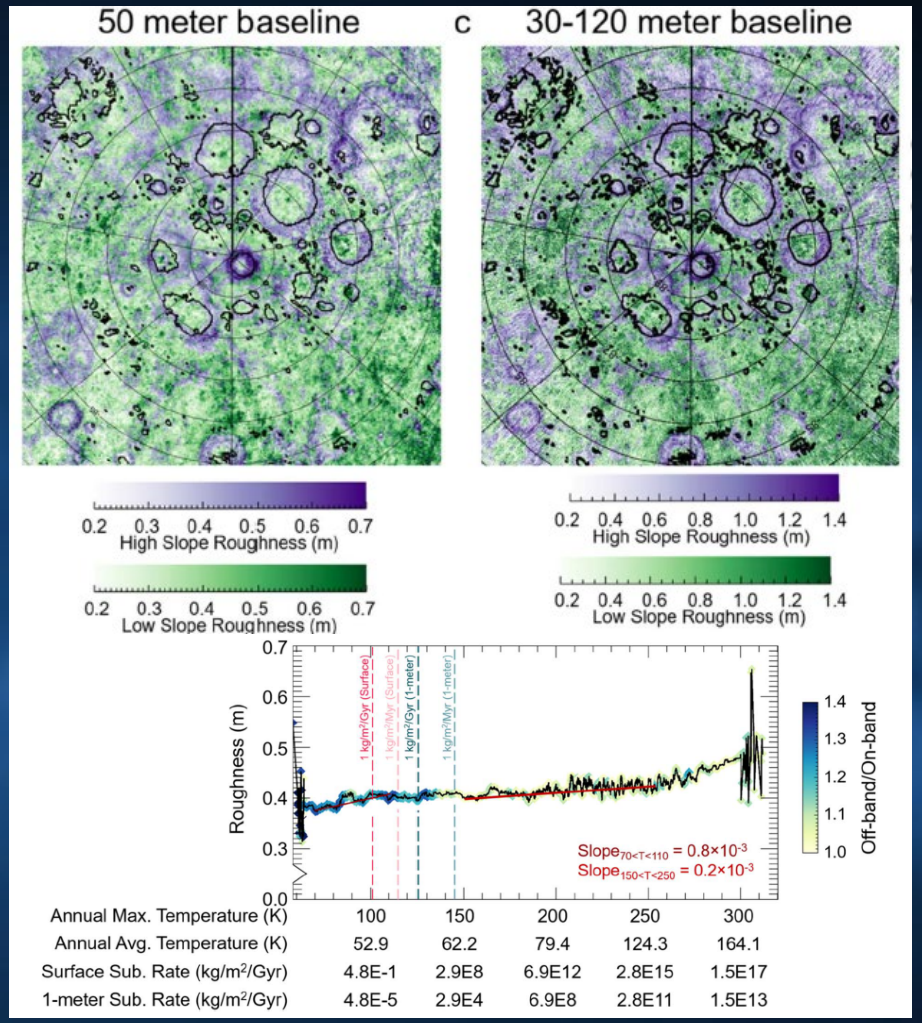
Influence of Condensed Volatiles on Surface Roughness at the Moon's South Pole



(top) Surface roughness at the Moon's south pole and (bottom) roughness vs thermal stability and LAMP Off-band/On-band albedo ratio.

Observations of lunar south pole cold traps support terrain softening resulting from the presence of condensed volatiles.

- Surface roughness is reduced within five of six pre-Nectarian south polar cold traps relative to their surroundings and within six of six pre-Nectarian equatorial craters relative to their surroundings.
- Surface roughness of Amundsen's permanently shadowed crater floor is subdued relative to its illuminated (presumably ice-free) crater floor by ~35%.
- A correlation exists between LAMP Off-band/On-band ratio, surface roughness, temperature, and sublimation rate. LAMP observations of the topmost ~100 nm may provide insight into where deeper ice may be accumulated, if surface ice is linked to subsurface ice.

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