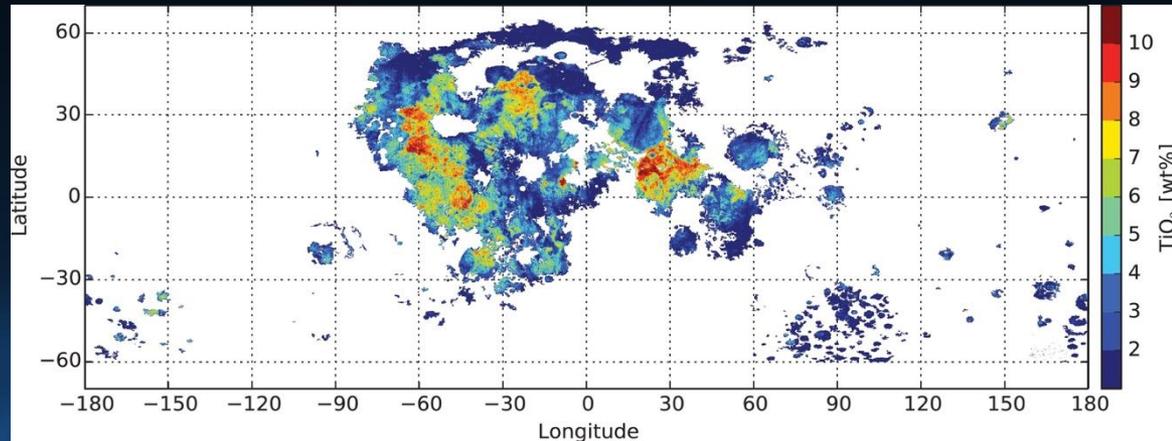


Mapping Minerals On the Moon: TiO₂ Abundances in Volcanic Regions

The Lunar Reconnaissance Orbiter Camera - Wide Angle Camera (WAC) has spectral channels sensitive to the abundance of the mineral ilmenite (specifically its main oxide, TiO₂). TiO₂ is found in varying abundances in lunar basalts.

The WAC TiO₂ map (top) illustrates the range of abundances across volcanic units, from a low of ~2 weight % to as much as 12.6 wt%. Apollo and Luna samples have TiO₂ abundances between 0.5 and 10.0 wt%.

This map serves as a key guide to identifying basalt compositions outside of what was sampled by Apollo and Luna, as well as locations for future *in situ* titanium and oxygen extraction.



WAC TiO₂ abundance map for lunar mare (latitude 70°S to 70°N, centered on the nearside). Color corresponds to 1 wt% of TiO₂ values. Values less than ~2 wt% (dark blue) are below the detection limit of the reflectance variations related to ilmenite content.

The highest mare TiO₂ abundances (> 10 wt%) are in the north-western part of Mare Tranquillitatis, while in the southern half there are patchy areas of lower TiO₂ (4-8 wt%), likely due to both true compositional variations of the mare and contamination by ejecta.

