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Estimated thorium abundances at the Lassell red spot

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Lunar red spots are features on the nearside of the Moon that exhibit high albedos as well as strong absorptions in the ultraviolet. It has been suggested that many of these red spots are extrusive, nonmare, volcanic features that could be composed of evolved lithlogies that are highly enriched in thorium. However, analyses of Lunar Prospector Gamma-ray spectrometer (LP-GRS) data have suggested that many of the lunar red spots have low thorium values that are not consistent with evolved lithologies. We use improved knowledge of the Th spatial distributions for small area features on the lunar surface to revisit the interpretation of Th abundances at several red spots, including the Lassell red spot. More specifically, we use a forward modeling technique to model the Th distribution of lunar surface features that are smaller than the LP-GRS footprint. The results from this study show that the Lassell red spot could have Th abundances as high as 35 ppm, a value that is consistent with evolved lithologies.