



Seasonal precipitation depth over the south polar icecap of Mars

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A re-analysis of the MOLA altimeter data across the south polar region of Mars using improved corrections to the altimeter data indicates a greater average depth of seasonal CO₂ than in our previous analysis. We derived zonal mean precipitation depths for every degree of latitude from 50S to 87S as a function of Ls. The precipitation depth was derived from the residuals to the best topographic model derived from the corrected altimetry data and ordered as a function of Ls. We averaged 50 consecutive passes of data across the pole, equivalent to 4 days and approximately 2 degrees of Ls. The data span covered over 1 Mars year and comprised 161 fifty-pass solutions for the depth of the precipitation. The solution shows a steady increase in depth with latitude and a dynamic range of 1.5 to 2 meters at 87S. This is in contrast to the north where the maximum depth occurs at latitude 80N, at the edge of the permanent cap. The implied density of the seasonal CO₂ in the south is close to 500 kg/m³.