A warm layer in the nightside mesosphere of Mars

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We report a new set of stellar occultation measurements for nightside temperature profiles made by the MAVEN/IUVS that provide evidence for a recurring layer of warm air between 70 - 90 km altitudes in the nightside mesosphere of Mars during Ls = 0º - 180º in Martian Year 33-34. The nightside profiles reveal a recurring peak of atmospheric temperature around 80 km over the equator to the middle latitudes in the northern hemisphere. The predictions of the Mars Climate Database have a warm layer with much smaller amplitudes. The observed peak amplitudes are larger than those predicted by the model by up to 90 K. Wavenumber-3 structures are seen in the warm layer that are potentially signatures of thermal tides or stationary planetary waves, with amplitudes two-times larger than predicted.

