Jupiter's global ammonia distribution inferred from Juno Microwave Radiometer Observations

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The Juno microwave radiometer (Juno/MWR) has made several observations of Jupiter's atmosphere by measuring the thermal emission from pressure levels down to a few hundred bars. The main objective of Juno/MWR is to determine Jupiter's deep water abundance because water is the key to understand Jovian meteorology that we observe at the cloud level, and because the deep water abundance hints at a giant planet's volatile and heavy element history. Since ammonia is the major opacity source in the Juno/MWR channels, it is especially important to figure out the ammonia distribution before we can conclude anything on the water abundance. At this stage of our analysis, we have inverted a global map (vertical and latitudinal) of ammonia distribution from the observed brightness temperatures at six wavelengths using the Markov Chain Monte Carlo technique. This method fully calibrates error and explores a wide range of the parameter space to avoid falling into a local minimum. The robustness of the retrieval is explained by matching the features in the ammonia distribution with the features in the microwave spectra. We will also announce the initial result of the retrieval of water abundance using the same technique.