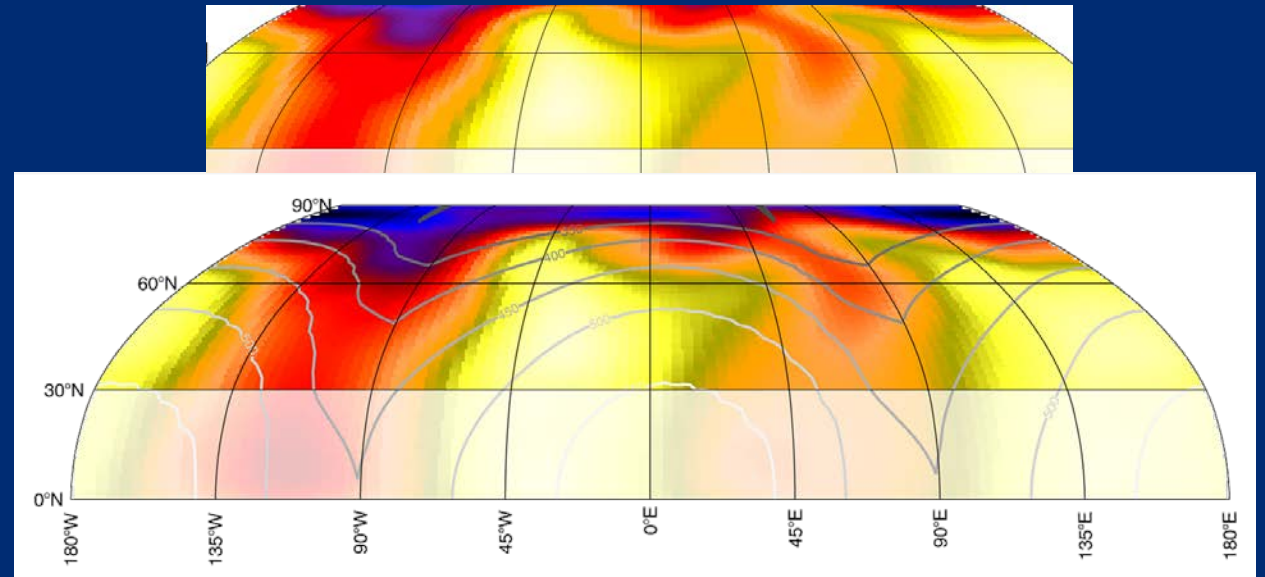


Measuring hydrogen on Mercury using MESSENGER's Gamma-Ray and Neutron Spectrometer

- Hydrogen, in the form of water ice, is present in Mercury's permanently shaded polar craters.
- Using data from the MESSENGER Gamma-Ray and Neutron Spectrometer (GRNS), we mapped hydrogen throughout Mercury's northern hemisphere, with mean abundance of $400 \pm_{150}^{250}$ ppm.
- The latitudinal trend agrees with earlier results showing enhanced hydrogen within Mercury's radar bright craters.
- Mid- and low- latitude variation in hydrogen abundance is anti-correlated with the temperature 20 cm beneath Mercury's surface.



Hydrogen abundance in parts per million (ppm) based on Gamma-Ray Spectrometer results and particle transport modeling. The contours show maximum temperature at 20 cm depth.

MESSENGER GRNS data reveal that more hydrogen exists in the subsurface at Mercury's cold poles than Mercury's hot poles.