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Comparison of Magnetospheric Ion Temperature Maps from In-Situ Measurements with Remote ENA-based Measurements KATHARINE TALLAKSEN, AMY KEESEE, EARL SCIME, West Virginia University — Ion temperatures in the magnetosphere exhibit significant variations that are strongly correlated with solar wind conditions not only during geomagnetic storms, but also during quiet times. Using data that did not distinguish between storm and quiet times, *Borovsky et al.* showed a strong, linear correlation with the solar wind velocity of ion temperatures at 12 Earth radii downtail and at geosynchronous orbit on the nightside of the Earth [*Borovsky et al.,* 1998]. However, *Borovsky's* empirical relations between solar wind speed and magnetosphere ion temperature are only valid for these two spatial locations. Remote measurements of the energetic neutral atom (ENA) flux emitted by the magnetosphere can provide global magnetospheric ion temperature maps that can be used to understand how the solar wind conditions affect different regions of the magnetosphere. These remote measurements can be compared to in-situ measurements to confirm the accuracy of the ENA-based analysis. We will present ion temperature maps of the Earth's magnetosphere constructed from data from the TWINS, Geotail, Cluster, and THEMIS spacecraft and sorted by solar wind velocity (high speed (greater than 400 km/s) wind and low speed wind). The data used cover the interval from January 2008 through April 2009. This work supported by NASA.

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