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Ion heating during geomagnetic storms measured using energetic neutral atom imaging[1] AMY KEESEE, West Virginia University, JUSTIN EL-FRITZ, University of Amsterdam, ROXANNE KATUS, EARL SCIME, West Virginia University — Energy from the solar wind is deposited into the magnetosphere during geomagnetic storms. Much of this energy is deposited into the plasma sheet, driving phenomena that leads to heating. The plasma sheet ions are then injected to the inner magnetosphere, driving the ring current. While ions can undergo adiabatic heating during typical drift motion, collisional and wave-particle interactions can also lead to ion heating. A technique to measure ion temperatures using energetic neutral atom (ENA) data has been developed using ENA data from the Two Wide-angle Imaging Neutral-atom Spectrometers (TWINS) mission global maps of ion temperature during the evolution of geomagnetic storms are made. These maps exhibit the location and characteristics of regions of ion heating and during which storm phase they occur. Superposed epoch analyses of such maps have demonstrated typical characteristics of ion heating during storms driven by coronal mass ejections as compared to those driven by high speed solar wind streams. The temperatures have been used to establish boundary conditions for modeling of the inner magnetosphere. We will give an overview of recent studies using TWINS ion temperature maps.

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