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Ion temperatures in the terrestrial ring current: Comparison between remote measurements and simulation AMY KEESEE, JUDITH CONNELLY, EARL SCIME, West Virginia University, MEI-CHING FOK, NASA Goddard Space Flight Center — The processes underlying the intensification of the ring current during geomagnetic storms are not completely understood. Strong electric fields transport ions from the plasma sheet to the ring current during geomagnetic storms, causing a depression in the geomagnetic field. However, these injected ions are initially cool and are heated up during the transport into the ring current. Magnetospheric modeling can aid in the determination of the underlying physics of ring current formation and heating by clarifying what processes are necessary for simulation results to match actual measurements. The simulation tool used in this study is the Comprehensive Ring Current Model (CRCM). Using data from the Medium Energy Neutral Atom (MENA) imager on the IMAGE spacecraft, two-dimensional maps of ion temperatures can be calculated throughout the evolution of geomagnetic storms. Ion temperature maps created using a CRCM simulation for a single storm and a superposed epoch analysis of MENA data from many storms both show a region of relatively cool ion temperatures at dawn surrounded by a ring of hotter ion temperatures. We will also present comparisons of time resolved ion temperature images using the two methods for individual geomagnetic storms.

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