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# One ring to rule them all: storm time ring current and its influence on radiation belts, plasmasphere and global magnetosphere electrodynamics

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We report studies of the storm time ring current and its influence on the radiation belts, plasmasphere and global magnetospheric dynamics. The near-Earth space environment is described by multiscale physics that reflects a variety of processes and conditions that occur in magnetospheric plasma. For a successful description of such a plasma, a complex solution is needed which allows multiple physics domains to be described using multiple physical models. A key population of the inner magnetosphere is ring current plasma. Ring current dynamics affects magnetic and electric fields in the entire magnetosphere, the distribution of cold ionospheric plasma (plasmasphere), and radiation belts particles. To study electrodynamics of the inner magnetosphere, we present a MHD model (BATSRUS code) coupled with ionospheric solver for electric field and with ring current-radiation belt model (CIMI code). The model will be used as a tool to reveal details of coupling between different regions of the Earth's magnetosphere. A model validation will be also presented based on comparison with data from THEMIS, POLAR, GOES, and TWINS missions.

INVITED TALK