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Multipoint Measurements and Global Simulations of the June 23, 2015 Geomagnetic Storm

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On 22-23 June 2015 a severe geomagnetic storm occurred with Dst minimum of approximately -200nT. During this extreme event, multipoint observations of magnetospheric dynamics were obtained by a fleet of Geospace spacecraft including MMS, TWINS, Van-Allen Probes and THEMIS. Extensive data coverage allows us to examine the responses of the ring current, radiation belts, ion composition and wave activity during this unusual event, both for the main phase of the storm as well as for the recovery phase. We present results of analysis of satellite data and simulation from a global coupled MHD-ring current model-radiation belt model (BATSRUS-CIMI) to connect multipoint observations from different parts of the magnetosphere. The output of virtual s/c in the global model is calculated and compared with the observations. The analysis helps to identify different magnetospheric domains from multipoint measurements and various magnetospheric boundary motions. We find the model is able to capture the global structure of the magnetosphere. We also explore how the initial disturbance from the solar wind propagates through the magnetosphere causing energization of plasma in the inner magnetosphere and producing severe geomagnetic activity.