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Memory effects in the ionosphere storm response

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Ionosphere storm effects have been studied for decades and while debate about the importance of the different mechanisms in producing effects (i.e. changes in neutral composition, meridional neutral winds, dynamo and penetration electric fields, excited atomic and molecular states, etc.) remains, most of the present ionosphere research is concerned with the relative importance of the mechanisms and how it changes throughout a storm. Much less emphasis has been placed on the importance of the pre-conditioning of the thermosphere ionosphere system in the resulting storm changes. In this paper we compare storm changes obtained for identical storms simulated starting from different initial conditions with the Coupled Thermosphere Ionosphere Plasmasphere Electrodynamics model. We also compare our theoretical storm results with ionosonde observed storm effects from similar storms, but which start from different initial conditions.