The Great American Solar Eclipse of August 21, 2017; Understanding the Response of the Ionosphere

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The great American solar eclipse of August 21, 2017 provides a unique opportunity to study the basic physics of the upper atmosphere and ionosphere. While the effects of solar eclipses on the ionosphere have been studied since the 1930s, and later matured in the last several decades, recent advances in first principles numerical models and multi-instrument observational capabilities continue to provide new insights. Upper atmospheric eclipse phenomena such as the generation of anomalous E-region enhancements subsequent to the event, ionospheric conjugate effects, and the generation of significant thermosphere bow wave with propagates into the nightside are simulated with high-resolution first principles upper atmospheric models and compared with observations to validate this understanding. Work sponsored by NASA.