



On the magnetospheric origin of nonconjugate auroral features

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The question whether auroral features are conjugate or not, and the search for the underlying scientific causes is of continued high interest in magnetospheric and ionospheric physics. Consequently, this topic has attracted considerable attention in space-based observations of auroral features, and it has inspired a number of theoretical ideas and related modeling activities. Potential contributing factors to the presence or absence of auroral conjugacy include precipitation asymmetries in case of the diffuse aurora, inter-hemispherical conductivity differences, magnetospheric asymmetries brought about by, e.g., dipole tilt, corotation, or IMF By, and, finally, asymmetries in field-aligned current generation primarily in the nightside magnetosphere. In this presentation, we will analyze high-resolution, global MHD simulations of magnetospheric dynamics, with emphasis on auroral conjugacy. For the purpose of this study, we define controlled conditions by selecting solstice times with steady solar wind input, the latter of which includes an IMF rotation from purely southward to east westward. Conductivity models will be augmented from previous studies to include both auroral precipitation proxies as well as the effects of the asymmetric daylight. We will analyze these simulations with respect to conjugacies or the lack thereof, and study the role of the effects above in determining the former.