

# **ANALYSIS OF A SUBSTORM DIPOLARIZATION EVENT WITH IMPLICATIONS ON THE PHYSICAL PROCESS FOR DIPOLARIZATION**

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A fundamental signature of substorm activity in the Earth's magnetotail is dipolarization in which the  $B_z$  component of the magnetic field increases significantly in a short-time scale. There are several potential physical processes that can give rise to dipolarization. Recently, we have identified from THEMIS observations one unique dipolarization event during which waves close to the ion-cyclotron frequency, excited at dipolarization onset, evolve to lower frequencies that match with the time-scale of dipolarization. This suggests that the physical process for dipolarization is intimately related to the excitation of these waves. Using the wavelet analysis of magnetic and electric fluctuations together with basic plasma theory of waves, we have identified the nature of the excited waves. This result enables us to draw conclusions on the possible physical process responsible for dipolarization seen in this event.

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