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Undulations at the Equatorward Edge of the Aurora Associated with Instabilities in the Dusk/Afternoon Sector Plasma Sheet W.S. LEWIS, J.L. BURCH, Southwest Research Institute, Texas, W. HORTON, J.C. PEREZ, Institute for Fusion Studies, The University of Texas at Austin, H.U. FREY, Space Sciences Laboratory, University of California at Berkeley, P.C. ANDERSON, Center for Space Sciences, The University of Texas at Dallas — On February 6, 2002 a series of large-scale undulations along the equatorward edge of the auroral oval were observed with the Far-Ultraviolet Wideband Imaging Camera on NASA's IMAGE satellite during the recovery phase of a moderate magnetic storm. The undulations occurred in the 18.5-14.5 magnetic local time sector between 63° and 71° magnetic latitude. Their wavelength and crest-to-base length averaged 292 km and 224 km, respectively; and they propagated westward with an average speed of 0.90 ± 0.06 km/s. Such undulations are a relatively uncommon auroral phenomenon, and the mechanism that produce them and the magnetospheric conditions under which they occur are not well understood. Simulations and theory are presented to interpret the undulations as the nonlinear stage of the ballooning-interchange mode in the presence of a sheared $\mathbf{E} \times \mathbf{B}$ flow. Comparison of the simulations and the data suggest that the Richardson's number is about ten.

Jean C. Perez
Institute for Fusion Studies, UT-Austin

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