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Interchange and Flow Velocity Shear Instabilitiesin the Presence of Finite Larmor Radius Effects TONY KIM, Air Force Research Laboratory, Wright-Patterson AFB, OH 45433, JAMES LUNDBERG, Air Force Research Laboratory, Wright-Patterson AFB, OH 45433/Riverside Research, VLADIMIR SOTNIKOV, Air Force Research Laboratory, Wright-Patterson AFB, OH 45433, EVGENY MISHIN, Air Force Research Laboratory, Kirtland AFB, NM 87117, THOMAS GENONI, DAVID ROSE, Voss Scientific Inc, Albuquerque, NM 87107, THOMAS MEHLHORN, Naval Research Laboratory, Washington, DC 20375 — Ionospheric irregularities cause scintillations of electromagnetic signals that can severely affect navigation and transionospheric communication, in particular during Equatorial Plasma Bubbles (EPBs) events. However, the existing ionospheric models do not describe density irregularities with typical scales of several ion Larmor radii that affect UHF and L bands. These irregularities can be produced in the process of nonlinear evolution of interchange or flow velocity shear instabilities. The model of nonlinear development of these instabilities based on two-fluid hydrodynamic description with inclusion of finite Larmor radius effects will be presented. The derived nonlinear equations will be solved numerically. The high-resolution simulations will be driven by the ambient conditions corresponding to the AFRL C/NOFS satellite low-resolution data during EPBs.

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