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Electron Dynamics in the Falling-Tone Chorus Wave Field[1] ILYA KUZICHEV, New Jersey Inst of Tech, ANGEL RUALDO SOTO-CHAVEZ, Syntek Techologies, Inc. — Whistler-mode chorus waves are one of the most intense wave phenomena in the Earth's inner magnetosphere. They are considered to be a major driver of the outer radiation belt dynamics, as they can efficiently scatter and energize electrons via resonant wave-particle interaction. These waves are observed as series of discrete coherent structures with rising or falling frequencies in the whistler frequency range (just below local electron cyclotron frequency). Such frequency chirping results in an additional term in the resonance Hamiltonian which describes particle dynamics in the given wave field. This term contributes to the total inhomogeneity parameter which determines acceleration of the particles trapped by the wave. In this report, we present the results of the test particle simulations of the electron dynamics in the field of a chirped wave. A general curvilinear relativistic code is developed to address the particle dynamics in the wave field, pre-determined from the simplified wave equations. We demonstrate that particle acceleration is controlled by the competition between the effective inhomogeneity related to frequency chirping and spatial inhomogeneity of the Earth's magnetic field.

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Ilya Kuzichev
New Jersey Inst of Tech

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