

Stationary wave condition of oblique whistler mode waves regarding Landau resonance

*謝 怡凱¹、大村 善治¹

*Yikai HSIEH¹, Yoshiharu Omura¹

1. 京都大学生存圏研究所

1. Reserach Institute for Sustainable Humanosphere, Kyoto University

Landau resonance appears in oblique whistler mode wave-particle interactions but not in parallel whistler mode wave ones. The electrostatic component of wave field triggers the trapping of electrons through Landau resonance. The resonance velocity of the Landau resonance becomes very close to the parallel group velocity of nearly parallel whistler mode waves at a certain frequency as functions of wave normal angles. Inside the wave packet, the trapped electrons move together with the wave group velocity along the magnetic field line and see a static amplitude and a phase of the wave. Thus, the condition is named stationary wave condition. Wave-particle interactions under this condition. We figure out the relationship between stationary wave condition and Gendrin angle of oblique waves. Wave-particle interactions under the stationary wave condition are revealed in this study by test particle simulations. We found that the trapped electrons undergoing the Landau resonance are accelerated efficiently. The energy gain of electrons undergoing the condition is higher than that of other electrons.

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