

R006-05

Zoom meeting B : 11/1 AM1 (9:00-10:30)

10:00-10:15

## 沿磁力線方向の磁気圏・電離圏不均一性を考慮したフィードバック不安定性理論

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### Feedback instability theory including field-aligned inhomogeneity of the magnetosphere and ionosphere

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We have recently extended the feedback instability theory, including inhomogeneity of the magnetosphere and the ionosphere. The detailed eigenvalue analysis clarifies that the altitude dependence of the ionospheric collision frequency may lead to stabilization of the ionospheric Alfvén resonator (IAR) mode which stems from the non-uniform Alfvén velocity profile in the magnetosphere. The theoretical analysis confirms that the stabilization is brought by an effective internal resistivity due to the ionospheric inhomogeneity, not by a shear of the ionospheric current in contrast to a previous study. Nevertheless, the field line resonance (FLR) type mode with lower frequency remains unstable even when the high frequency IAR modes are stabilized, as confirmed by the eigenmode analysis and the numerical simulation. The present study demonstrates a robustness of the feedback instability mechanism providing spontaneous growth of the auroral arc structure in the magnetosphere-ionosphere coupling through the FLR type modes even with strong inhomogeneity in the magnetosphere and the ionosphere.