R005-02
B 会場 ：9/24　PM1 （13:45-15:30）
14:00〜14:15

Es 層形成過程の中性大気とプラズマ大気の同時観測による解明: RIDE キャンペーン

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Elucidation of sporadic E layers by simultaneous observation of the neutral and ionized atmospheres: RIDE rocket campaign

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Rocket Investigation of Daytime E-region (RIDE) campaign is to directly observe the neutral atmosphere, plasma atmosphere, the electric field, and the magnetic field that generates the sporadic E layer with the S-310-46 sounding rocket from Uchinoura in the summer of 2024. The objectives of this sounding rocket experiment are as follows:

(1) Elucidate phenomena in which the interaction between neutral atmosphere and plasma is important by combining direct observations by the sounding rocket with a numerical model and ground-based observations.
(2) Complete measurement packages of the neutral atmosphere, plasma, and electromagnetic fields for sounding rockets and satellites.
(3) Develop human resources for future deployment.

The daytime sporadic E layer around 100 km altitude is the target of the campaign. Elucidation of the interaction between the neutral and plasma atmospheres, which is thought to be the cause of this phenomenon, will lead to the forecast of the sporadic E layer, which has an impact on social systems such as radio propagation disturbance. Although there is a wide range of ionospheric phenomena in which the interaction between neutrals and plasma is important, their elucidation has not been sufficiently advanced due to the difficulty of simultaneous observation of both atmospheres. In this experiment, comprehensive direct measurements of the neutral atmosphere, plasma atmosphere, and electromagnetic field will be made at 90-130 km altitude during the ascent and descent of the S-310-46 rocket at 11-14 local time in summer at mid-latitudes. This local time range is when the Es layer is expected to reach an altitude of around 105 km as it develops and the interaction between the neutral and plasma atmospheres is expected to be intense. Combined with numerical model predictions, the contribution of the electric field and wind in the formation of the Es layer can be clarified. In addition to this direct measurement by the rocket, ground-based observations at multiple locations will be conducted to evaluate the temporal evolution and spatial extent of the Es layer observed by the rocket and its effect on the anomalous propagation of radio waves used in air navigation and other social systems.