

Spatial structure of Sporadic E layer -obtained from SEEK2 campaign

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Mid-latitude sporadic-E layers have been observed for a long time and the formation mechanism based on the wind-shear theory is currently accepted among the science community. However, understanding of energetics on the Es is still far from satisfaction because to measure T_e in the thin Es layer is very difficult and accurate T_e measurement is scarce in the past. In August 2002, two sounding rockets were launched to study the generation mechanism of Field Aligned Irregularity (FAI), associated with Es (SEEK2 campaign). We succeeded to measure electron temperature inside Es layer by the fast bias sweep Langmuir probe onboard the S-310-31 rocket.

The temperature was gradually decreasing at bottom side of Es layer and gradually increasing at topside of Es layer.

Our outputs are summarized as follows;

1. T_e inside Es is surely lower than outside Es, and T_e observed is much higher than possible T_n . N_e and T_e is anti-correlated outside Es. These two facts strongly suggest that there exists a heat source which elevates T_e higher than T_n .

2. Combined T_e/N_e data with the electric field which was simultaneously measured on board S-310-31 and ground based radar echo, 3-D Es structure is obtained.