

Comparison between Ca⁺ layer and sporadic E layer over Syowa Station

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Sporadic E (E_s) layers in the mid-latitudes are generally accepted to be formed when metal ions in the MLT region converge in a thin layer due to the vertical shear of neutral atmospheric horizontal winds, especially zonal winds. On the other hand, the auroral E_s layer produced by energetic particle precipitation during auroral substorms is well known as an E_s layer in polar regions, but there is also an E_s layer that occurs during geomagnetic quiet time. At that time, metal ions are thought to play an important role in the E_s formation process. To verify this, we investigated the relationship between the Ca⁺ ion layer and the E_s layer observed by a resonance scattering lidar and ionosonde, respectively, at Syowa Station.