

Meteor activity and sporadic E-layers

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In average width it is difficult to explain variety of particularities of the behavior sporadic layer E_s ionospheres without attraction long-lived metallic ion of the meteoric origin.

Mass spectrometric measurements of ion composition using rockets indicate the presence of metal ions Fe^+ , Mg^+ , Si^+ , Na^+ , Ca^+ , K^+ , Al^+ and others in the E-region of the ionosphere. The most common are the ions Fe^+ , Mg^+ , Si^+ , which are primarily concentrated in the narrow sporadic layers of the ionosphere at altitudes of 90-130 km.

The entry of meteoric matter into the Earth's atmosphere is a source of meteor atoms (M) and ions (M^+) that later, together with wind shear, produce midlatitude sporadic E_s layer of the ionosphere.

To establish the link between sporadic E_s layer and meteoroid streams, we proceeded from the dependence of the ionization coefficient of meteors β on the velocity of meteor particles in different meteoroid streams.

We investigated the dependence of the critical frequency f_oE_s of sporadic E on the particle velocity V of meteor streams and associations. It was established that the average values of f_oE_s are directly proportional to the velocity V of meteor streams and associations, with the correlation coefficient of $0.53 < R < 0.74$.

Thus, the critical frequency of the sporadic layer E_s increases with the increase of particle velocity V in meteor streams, which indicates the direct influence of meteor particles on ionization of the lower ionosphere and formation of long-lived metal atoms M and ions M^+ of meteoric origin.