**Auroral precipitation model and its application to the ionosphere studying under different magnetic activity levels**

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The report provides a short overview of various models of auroral precipitation. Global distribution of different precipitation regions is shown by using the Auroral Precipitation Model (APM) developed in the Polar Geophysical Institute (<http://apm.pgia.ru/>). According to the APM model the average energies and energy fluxes of precipitating particles for different levels of geomagnetic activity, expressed by values of the AL and Dst indices, were calculated in coordinates of corrected geomagnetic latitude – geomagnetic local time. The APM model was applied to calculate the global distribution of the auroral luminosity in visible and UVI spectral ranges and to calculate the rate of ionization in regions of auroral precipitation. A comparison of the planetary distribution of the characteristics of electron and ion precipitation were carried out. It was shows that the planetary power of ion precipitation at low magnetic activity *AL* = -100 nT is ~12% of the electron precipitation power and exponentially decreases to ~4% at *AL* < -1000 nT. The ion precipitation model was used to calculate the plasma pressure at the ionospheric altitudes. The planetary distribution of integral ionospheric conductance depending on the magnetic activity was calculated by using both electron and ion precipitation models.