

## Empirical ion-upflow model in polar ionosphere

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In recent years, satellite observation clearly revealed that ionosphere is important as a source of magnetospheric plasmas. As many satellites have observed ionospheric heavy ions in magnetosphere, it is necessary to study how much influences behavior of ionosphere and existence of heavy ion have on the plasma dynamics around the earth. In order to know the behavior of heavy ion in the ionosphere and the magnetosphere, comparison between numerical simulation and observation are one of the effective way. But the model which should actually be compared and referred to the ion outflow in the ionosphere or as magnetospheric plasma source does not exist. We have tried to construct an empirical model which estimates ion upflow flux from polar ionosphere. In this study, considering effects caused by change of geomagnetic activity, we built the new ion outflow model.