

Dynamical features of extended sodium distributions originated from Io

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We made 2-dimensional imaging observations of the D-line emission distribution of Iogenic sodium atoms, and made model analyses to investigate supply processes of sodium atoms. It is concluded that (1) the observed extended sodium distribution outside Io's orbit is attributed to the neutralization of corotating magnetospheric ions, and (2) the charge exchange of sodium ions and the dissociation and dissociative recombination of sodium-bearing molecular ions are appropriate as source mechanisms. From the model analysis using these source mechanisms, it is suggested that the extended sodium distribution is largely dependent on the plasma environments near Io.