Relation between extended sodium distribution originated from Io and around Io

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We have performed imaging observations of the D-line emissions of Iogenic sodium atoms. The method of the observation is the 2-dimensional imaging observations whose field of views are 20Rj and 400Rj around Jupiter. From these observations, we investigated the characteristics of the emission distribution and their temporal variations. Based on these observations, we have also performed model analyses to discuss source processes of sodium atoms and temporal variation of sodium atom distribution, and presented the comprehensive source process which can consistently reproduce the observed characteristics. From these studies, we concluded that the composition of both charge exchange and molecular ion destruction processes are appropriate as source mechanisms of extended distribution of sodium atoms. The initial conditions of released sodium atoms through these two processes depend on the plasma environment around Io and in the Io torus, so that we can investigate interaction between Io and the Io torus plasma by using spatial and temporal variation of extended sodium distribution. In this presentation, we discuss about the plasma environment near Io and Io's orbit, based on the temporal variation of the D-line emission and the dawn - dusk asymmetry of emission distribution in the observation results.