# Estimation of the subsolar magnetopause distance with IMAGE/LENA

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Recent remote sensing studies with the low energy neutral atom (LENA) imager on the IMAGE spacecraft have shed new light on the understanding of the dynamics of the subsolar magnetopause. Using an analytic model of magnetopause neutral atom emission, Collier et al. (JGR 2005) have shown that the LENA count detected coming from the general direction of the subsolar magnetopause clearly increases or decreases in response to the motion of the magnetopause. By making a simple model for the distribution of the magnetosheath flow and density, Taguchi et al. (JGR 2004) have suggested that the LENA's line-of-sight having the peak count in the direction of the dayside low-latitude magnetosheath tilts somewhat Earthward at the inward motion of the subsolar magnetopause. In the present study, extending the previous studies, we attempt to identify the emission whose line-of-sight looks into the subsolar magnetopause, and discuss the motion of the magnetopause with a timescale of 2 min. From the noon-midnight orbits of 2001, we found several events for which significant neutral atom emissions are detected coming from the direction of the dayside low-latitude magnetosheath, and examined the emissions for the sectors whose line-of-sight is mapped to the geocentric distance of 5 to 12 Re on the equatorial plane. Results of analyses show that the line-of-sight for the peak emission is mapped to the region inside 9 Re when the LENA total count is highly enhanced. From those events we took the emission that occurred at the timing of the geosynchronous magnetopause crossing of GOES 8 or GOES 10, and examined the LENA's line-of-sight direction that looks into the geocentric distance of 6.6 Re at the equatorial plane. The examination shows that this direction is in most cases one (8-degree) sector Earthward of the LENA's line-of-sight direction for the peak emission. We consider how this relation can be extended or modified for other situations, by combining the observation with the calculation of neutral atom emissions using the global MHD model.