

Formation of large-scale magnetic loop systems connecting two active regions

Masaki Yokoyama[1]; Satoshi Masuda[1]

[1] STEL, Nagoya Univ

A large-scale magnetic loop system connecting the northern and the southern hemisphere (Transequatorial Loop System:TLS), is one of hot topics in these several years. Kahn and Hudson (2000) discussed the relationship between TLS activities (disappearance/formation) and CMEs. Glover et al. (2003) statistically studied characteristics of TLSs related to a CME. However, the formation process of TLSs is still not clear. Tsuneta (1996) gave an explanation for formation of a particular TLS, connecting two active regions in the northern and the southern hemisphere respectively, as the result of magnetic reconnection by expansion of both active regions. Even in the case that there is a large difference in longitude between two active regions, there aren't few TLSs connecting them obliquely beyond the equator. Does the same mechanism work to form such a TLS? We focus our research interest on the initial phase of the TLS, which was studied by Khan and Hudson (2000). This TLS connects NOAA8210 in the southern hemisphere and NOAA8214 in the northern hemisphere. The former is located at the 40-degrees eastern position from the latter. It is difficult to conclude that this TLS is formed by magnetic reconnection between two magnetic loop systems in two active regions like Tsuneta's case. Before this TLS is formed, there is a small bright region in soft X-rays. This small region is connected with NOAA8210 and NOAA8214 by the two different large-scale loop systems. It is plausible that this TLS is formed by loop-loop interaction type of magnetic reconnection which occurs between these two large-scale loop systems. However, still there is a possibility that this TLS is formed by the cusp-type magnetic reconnection between open field lines from NOAA8210 and NOAA8214. We will discuss the validity of both scenarios from various angles in this presentation.