P109b Mopra mapping observations with multi-lines of dense cores in Lupus I

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Recently, high sensitivity mappings of nearby molecular clouds in far-infrared and submillimeter bands with Hershel and AzTEC/ASTE show ubiquitous existence of the filamentary structures with 0.1-pc uniform width. It is important to investigate dense core formation from large scale structure via fragmentation. To make the first step, we could investigate whether the rotational axes of core has correlation with the elongation of the filament or not. We have conducted MOPRA multi-line mapping observations covered on 0.02 - 0.2 pc scale of dense cores in a filamentary cloud of nearby Lupus I at 140 pc. The maps of $C^{18}O(1-0), N_2H^+, HC_3N(10-9)$ show well-associated with six cores. The rotational axis determined by the velocity gradient of these molecular lines shows randomly directed compared with the elongation of the filament. Although there are only six sources, this trend is consistent with past dust continuum observation which shows that the elongations of a core are not correlated with the elongation of the filament. Therefore, it is suggested that the direction of angular momentum of a core are determined by local physical condition such as local magnetic direction. Actually, some sources in Lupus I have rotational axis parallel to the direction of magnetic field.