

Pattern analysis of young stellar clusters

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Abstract. We revealed a statistically significant clustering in the all sky distribution of AKARI-WISE young stellar objects with large groups of elongated and bush types.

Keywords. stars: formation — ISM: individual (Orion molecular cloud complex)

We applied statistical pattern analysis methods on the YSOs selected from the AKARI FIS (Yamamura *et al.* 2010) and WISE (Wright *et al.* 2010) point source catalogues (Tóth *et al.* 2012). The internal structure of the YSO clusters were investigated using the minimum spanning tree method of Cartwright & Whitworth (2004), as described in Gutermuth *et al.* (2009). Cluster morphology parameters such as elongation and clumpiness were derived. Two cluster types were separated: the elongated or filamentary type (no side-branches or simple side-branches) and the bush type (small elongation parameter, complicated side-branches with sub-branches). We found and investigated 2606 YSOs in the Orion region ($180 < L < 225$, $-25 < B < -1$), and located 229 YSO groups, 75 groups with $N > 3$ of which there were similar number of elongated and bush types. The YSO groups are mostly seen in association with the main clouds of the Orion molecular cloud complex, the large ones are all close to the density peaks.

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