

## Star formation in bright-rimmed clouds and associated clusters

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**Abstract.** We present preliminary results of the young star cluster and bright-rimmed clouds (BRCs) associated with the W5 East region. We used  $UBVI_c$  broad-band photometry and archival infrared data from 2MASS and *Spitzer* for W5 E region. The basic parameters of the cluster and age distribution of the detected young stellar objects (YSOs) have been discussed.

*Keywords* : stars: young clusters - stars: mass function - individual: W5 E

### 1. Introduction

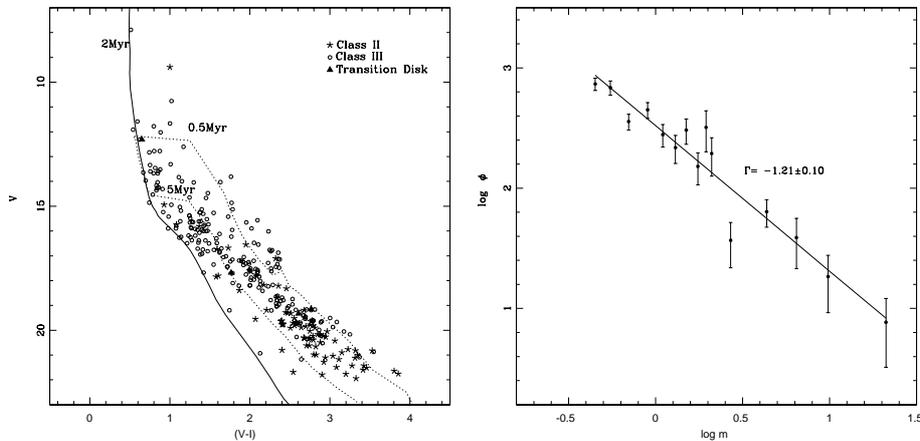
The W5 East HII region is an active star forming region with the indication of the triggered star formation. The region is primarily ionised by a centrally located O7V star HD18326. Recent observations with *Spitzer* Space Telescope detected a dense cluster of stars centered around the HD18326 (Koenig et al. 2008). This region harbors BRCs 13, 14 and one more probable candidate BRC (Niwa et al. 2009).

### 2. Data, analysis and results

The CCD  $UBVI_c$  optical observations of W5 E were carried out using the 1.05-m telescope of KISO Observatory, Japan and 1.04-m *Sampurnanand* Telescope

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**Figure 1.** The distribution of YSOs in the cluster region (left panel) and the MF derived using optical data (right panel).

(ST) of ARIES, Nainital. Near-infrared (NIR)  $JHK_s$  data for point sources within a radius of  $20'$  around the central cluster have been obtained from the Two Micron All Sky Survey (2MASS). The *Spitzer* data from Koenig et al. (2008) has been used to identify Class 0/I and Class II YSOs.

The radial density profile indicates that the cluster radius is about  $6'$ . Using the (U-B)/(B-V) colour-colour (CC) diagram the interstellar reddening,  $E(B-V)$ , in the cluster region is estimated to be  $\sim 0.5 - 0.8$  mag. The ratio of total-to-selective extinction,  $R$ , is found to be  $\sim 3.1$ , indicating a normal reddening law in the cluster region. The  $V/(V-I)$  colour-magnitude diagram (CMD) for the YSOs in the cluster region is shown in Fig. 1. Post-main sequence isochrone for 2 Myr by Girardi et al. (2002) and pre-main-sequence isochrone for 0.5 and 5 Myr by Siess et al. (2000) are overplotted on the CMD for a distance of 2 kpc. The present distance estimate is in agreement with the previous estimate (Becker & Fenkart 1971). The majority of the YSOs have ages between 0.5 - 5 Myr indicating a possibility of non-coeval star formation. The slope of the mass function (MF),  $\Gamma$ , in the mass range  $0.4 \leq M/M_{\odot} \leq 30$  can be represented by  $-1.21 \pm 0.10$  (Fig.1 right panel), which is comparable to the Salpeter value (-1.35). The photometric analysis of the BRCs 13 and 14 regions shows that the stars inside the bright rims are younger than the stars towards the ionising star. The distribution of NIR excess sources (selected using the NIR CC diagram) shows a nice alignment from the ionizing star towards the rims (see, for details Chauhan et al. 2009).

## References

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