

## The Local Stellar Population of Slow Nova Regions in the SMC

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### 1. Introduction

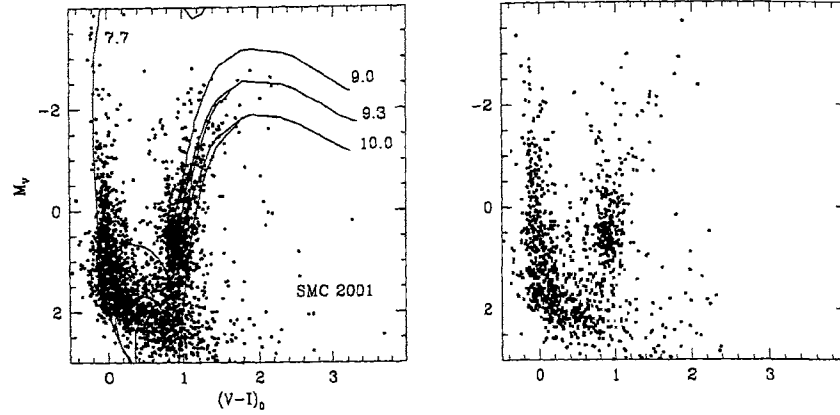
Population synthesis models of the statistics and properties of Galactic cataclysmic variables (CVs) and extragalactic novae indicate that the rate of formation of CVs, the nova rate and the distribution of novae over speed classes depend on the star formation history of the Galaxy. It was also suggested that the fast novae belong to the disk population, whereas the slow novae belong to the bulge population. Our previous study on the stellar populations of the nova regions in the LMC (Subramaniam & Anupama 2002) indicated that the parent population of fast and moderately fast novae is likely to be in the age range 1.0 – 3.2 Gyr. The single slow nova in the LMC indicated that the parent population of slow novae could be older than that of the fast novae. The identification of the parent population of the two slow novae in the SMC would thus help in understanding the progenitors of novae of different speed classes.

### 2. Data on Novae and Field Star Population

There are 14 novae detected in SMC so far, of which the rate of decline can be estimated only for 5 novae. The 5 novae were classified as one fast nova, 2 moderately fast and 2 slow novae. The  $V_i$  ( $V-I$ ) data of field stars around the nova regions are taken from OGLE II data Udalski et al. (1998). This survey covers two slow nova regions and around four novae with unknown speed class. The results of the study of stellar population around two slow novae, SMC 1994 and SMC 2001 is presented here. We have used stars within 4 arcmin radius from SMC 2001 and 2 arcmin radius from SMC 1994. These correspond to 64 pc and 32 pc respectively, for a distance modulus of 18.7 mag. The colour-magnitude diagrams (CMDs) of the regions around the two novae are shown in figure 1. The reddening  $E(V-I)$  is 0.05 mag and the distance modulus is 18.7 mag. The CMDs are fitted with isochrones of Bertelli et al. (1994) for  $Z=0.004$  for ages older than 1 Gyr and with  $Z=0.008$  isochrones for younger ages. The spread in the red clump stars could be due to the depth in the line of sight as well as small variation in reddening along the line of sight, spread

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**Figure 1.** The CMD of the local stellar population of two slow novae are shown here. The isochrones from Bertelli et al. (1994) are also shown along with the ages ( $\log \tau$ ). At limiting magnitudes, error in V magnitude is about 0.1 mag.

due to variation in metallicity is negligible. The two CMDs are strikingly similar and isochrones of similar age fit the stellar population, particularly the intermediate age population.

### 3. Results

The local stellar population around both the slow novae in SMC show that the slow nova progenitor is likely to fall in the age range of 1 – 10 Gyr. A similar result was obtained for one slow nova in LMC. This indicates that the slow nova progenitor could belong to an older population, when compared to the progenitor of the fast and moderately fast novae.

### References

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 Subramaniam, A., Anupama, G.C., 2002, *A&A*, 390, 449  
 Udalski, A., Szymanski, M., Kubiak, M., Pietrzynski, G., Wozniak, P., Zebrun, K., 1998, *Acta Astron.*, 48, 147