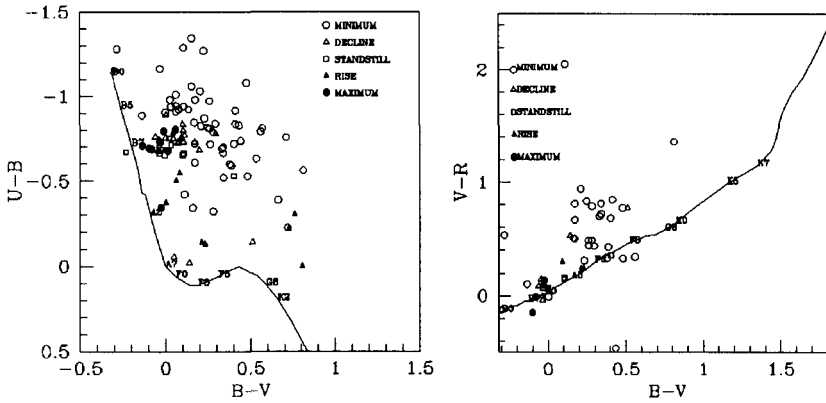


# SIMULTANEOUS MULTIWAVELENGTH OBSERVATIONS OF DWARF NOVAE SYSTEMS AT QUIESCENCE AND IN OUTBURST

G. TOVMASSIAN<sup>1</sup>, J. ECHEVARRIA<sup>1</sup>, E. PEREZ<sup>1</sup>,  
D. H. P. JONES, M. SHARA, M. TAPIA<sup>1</sup>,  
J. BOHIGAS<sup>1</sup>, R. GILMOZZI, R. COSTERO,  
J. A. LOPEZ<sup>1</sup>, M. ROTH<sup>1</sup>, M. ALVAREZ<sup>1</sup>,  
L. F. RODRIGUEZ, E. DE LARA, R. STOVER,  
C. MARTINEZ-ROGER, F. GARZON, N. ASTRIAN,  
E. ZOLDOS, J. MATTEI, F. BATESON

*1. Instituto de Astronomía, Universidad Nacional  
Autónoma de México, Ensenada, México*

The results of photometric and spectroscopic observations of dwarf novae are presented. The data were obtained during an international program of multiwavelength observations, held in 1986 February at several observatories, of dwarf novae during the first and subsequent days of outburst. During the campaign numerous dwarf novae were monitored in order to catch them in outburst. Preliminary results and analysis of some objects are reported elsewhere. A total of 30 dwarf novae were observed in the northern and southern hemispheres. Among them 37% were caught in outburst, including 10% on the rise to outburst and 17% in decline. Photometric observations were carried out in the *UBVRI* system and colour indexes were calculated. Colour-colour diagrams and light curves of the particular stars were constructed.  $U - B$ ,  $B - V$  and  $V - R$ ,  $B - V$  diagrams are presented in Figs. 1 and 2 respectively. The data shown in Figs. 1 and 2 confirm many results obtained previously, and shows clustering of the objects, depending on their orbital periods, above the main sequence at minimum (Echevarria 1984; Echevarria, Costero & Michel 1993). This region is a very large one, reflecting differences in types of dwarf novae. SU UMa type stars and other short period systems are considerably bluer in both  $U - B$  and  $B - V$  colours. During an outburst cycle, the systems trace a loop on the colour-colour diagram, with the general pattern shown in the  $U - B$ ,  $B - V$  diagram. However the colour changes are very individual and rather characteristic for each star. The large part of the loop covers the rise to outburst. The systems at maximum occupy a very distinct region, slightly above main sequence B9-A0 stars. However several systems



*Figure 1.* Left: Colour-colour diagram of dwarf novae at several stages of outburst and quiescence. The solid line corresponds to the main sequence. Right:  $B - V$  versus  $V - R$  diagram for the same objects shown in the left plot. Note the clustering of points at outburst maximum near the main sequence.

displayed peculiarities, which are also presented. A clear delay of UV flux was observed in the case of SS Aur in outburst, as opposed to MU Cen, which displays increasing  $U$  flux during the slow rise to outburst. DO Dra is also peculiar for its extremely red colours in the near-IR, and it exhibits a huge contribution from the secondary despite its relatively short orbital period.

## References

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 Echevarria, J., Costero, R., Michel, R., 1993, *A&A*, **275**, 201