PHOTOMETRIC AND SPECTROSCOPIC INVESTIGATION FOR THE OPTICAL FLARE OF V711 TAU (=HR 1099) IN 1989

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ABSTRACT  The RS CVn system V711 Tau (=HR 1099) was observed in both UBV, H\beta photometry and high S/N H\alpha line spectroscopy for flare monitoring at Xing Long station during the MUSICOS 1989 campaign. An unusual (the largest one reported in RS CVn systems) flare in optical wide-band was detected with the amplitudes: \( \Delta U = 0.61, \Delta B = 0.27 \) and \( \Delta V = 0.18 \). At the same time the equivalent width showed an obvious increase from 3.14 to 4.04 \( \AA \) at the beginning of the flare. Together with the observations at ESO and Hawaii, there are at least two \( H\alpha \) flares were detected within one continuous orbital cycle. We report on the following results from photometric and spectroscopic investigations: (1). A two-flare model with total area about 11% of visual hemisphere can reconstruct fairly the observed light curves; (2). The total radiated energy of this flare in U, B, V bands is estimated more than \( 6 \times 10^{36} \text{erg} \); (3). Two \( H\alpha \) flares may be connected with two different spot active regions, respectively and the second one showed much larger increases of the equivalent width from 3.08 to about 5.4 \( \AA \); (4). The behavior of flare in wide band was compared with the model based on the inverse Compton effect.