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ACTIVE AND INACTIVE STATE OF AM Her = 3U 1809+50

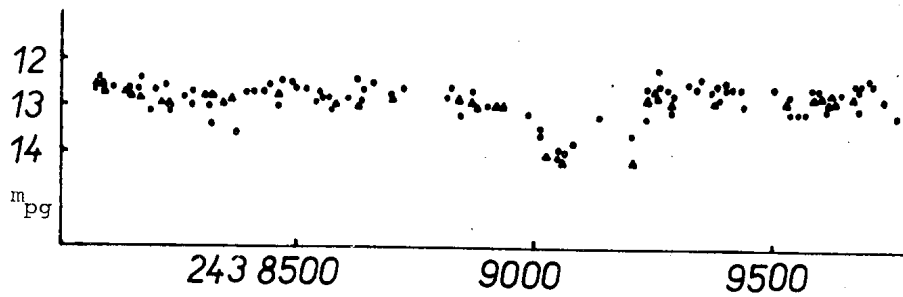
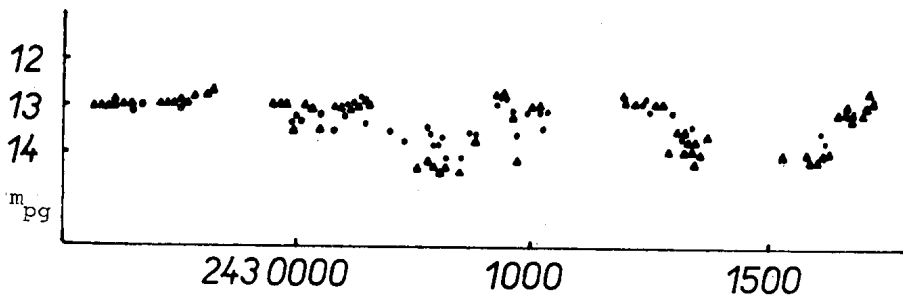
The preliminary results of the observations on 700 Sonneberg archiv plates from years 1928-1976 show that the variable star AM Her, the optical candidate for the high galactic latitude X-ray source 3U 1809+50, exhibits two different states in its long-time light curve. During the first of them (we call it active state) is AM Her approximately  $m_{pg} \approx 12^m.8$  bright and shows probably small amplitude light variations of  $0^m.3$  in the time scale of approximately 200 days or more. During the inactive state AM Her is roughly  $m_{pg} \approx 14^m.2$  faint. The inactive state was found in the following intervals:

J.D. 242 7150-7310, J.D. 242 8200-8450, J.D. 243 0700-0900,  
J.D. 243 1300-1620, J.D. 243 2800-3500, J.D. 243 9020-9230 and  
J.D. 244 1570-1700.

The Figures show two selected parts of the long-time variations of AM Her on our plates.

The existence of two different states of AM Her is similar to the other high latitude X-ray source HZ Her=Her X-1. Probably these variations are caused by a mechanism like that in the HZ Her system, i.e., the X ray heating and reflection effect. The short-time variations (eclipsing light curve) with very broad secondary minimum as compared with the primary one of AM Her (Cowley et al., IAUC 2984) are similar to the HZ Her inactive state light eclipsing variations (Wenzel and Hudec, IBVS No.1082), too. Thus, the optical behaviour of AM Her supports strong evidence to the identification AM Her=X-ray source 3U1809+50. However, the orbital period of AM Her system is only 136 min. (Cowley et al., IAUC 2984) as compared with HZ Her (1.706175 day; Wenzel and Hudec IBVS No.1082) and so the light curve obtained from the plates (expos. from 30 to 180 minutes)

cannot show the detailed short-time eclipsing variations, but only the mean brightness with smaller variations.



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