THE CAUSES OF THE LIGHT VARIATIONS IN AG Peg

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It can be shown that the long-term periodic variations in the U band, distinctly observed in AG peg by UBV photometry (Belyakina 1970) from the early 1960's with amplitude increasing, over since, have in fact two principal reasons for their existence. One of these is transparency of the envelope to the Lc-emission of the hot component in AG Peg arisen in the 1950's and increasing since then. The second one is connected with the changes of the transparency of the compact part of the gas envelope located close to the hot component when in moves along its orbit (Yudin 1987). It is interesting to note that for the orbital solution with non-zero eccentricity (Hunchings et al. 1975) the transparency minimum and consequently the flux emission maximum for the gas envelope in AG Peg are observed in the moment when the hot component is close to its apoastron. The amplitude of the periodic variations in V increases due to the existence in AG Peg of the effect of noticeable heating of the cool component's hemisphere facing its hot companion. Using the TiO bands in the red the cool component in AG Peg is classified as slightly earlier than M2 from illuminated side and slightly later than M3 from the opposite one (Ipatov and Yudin 1986).

Nowadays the radiation flux from the gas envelope, that is its optical depth, changes from maximum to minimum by about a factor of 2.5. In 1984, at the maximum of its brightness, only about 37% of the total amount of the Lc-quanta were absorbed in the gas envelope. At the same time, the hot star's temperature and bolometric luminosity were equal to about 7.9 10^4 K and 5.7 10^3 Lo respectively (L(h,bol) 4 L(c,bol); Ipatov and Yudin 1986). A comparison of the hot component's bolometric luminosity at present with that derived for the moment of its visual brightness maximum show that the decline from the maximum have not been accompanied by the noticeable luminosity changes

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yet (Boyarchuk 1967).

The unique light curve of the AG Peg during its outburst, which has been continuing since 1850's, and its very long-lived W-R phase accompanied by the very high rate of mass loss by the hot component ($\dot{M}>10^{-6}$ Mo yr^{-1}), having shed already more than 10^{-4} Mo from its hydrogen envelope, could be understood if we suppose that the present outburst of the hot component in AG Peg was connected with the helium (but not hydrogen) shell flash.

The differences in the light curves of symbiotic novae (AG Peg, V1016 Cyg, HM Sge) and classical symbiotic stars (Z And, CI Cyg, AG Dra) are due to a different role of the accretion process in these systems. In symbiotic novae, accretion is not a noticeable energy sources of the hot subdwarf. It can play only role of a supplier of hydrogen fuel to its surface when the hot subdwarf already is cooling down. In classical symbiotic systems, at least during the outbursts of their hot components, accretion becomes a predominant source of energy of the hot subdwarf.

The transition from a symbiotic nova to a classical symbiotic star takes place at the moment when the cool component's size is approaching the size of its Roche lobe, resulting in a sharp increase of the accretion rate of its matter onto the hot component (Yudin 1987). The nonstationarity of this process leads to the emergence of the nova-like outbursts on the light curves of symbiotic stars which are now called classical.

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