

## SYNCHRONIZATION ANOMALIES IN CLOSE BINARIES AS A TEST OF RAPID EVOLUTIONARY PROCESSES

A. GIMÉNEZ

*LAEFF(I.N.T.A.-C.S.I.C.), Apartado 50727, E28080 Madrid, Spain*  
*ag@laeff.esa.es*

AND

A. CLARET

*Instituto de Astrofísica de Andalucía, C.S.I.C., Apartado 3004, E-18080 Granada, Spain*  
*claret@iaa.es*

Close binaries with late-type components generally present rotational velocities synchronized with their orbital period. This is a well known effect of tidal evolution in binary systems which is particularly efficient in stars with convective envelopes. Nevertheless, some cases are known where the angular velocities of the component stars are clearly different from each other or even from that of the orbit. Good examples are the evolved systems TZ For and  $\alpha$  Aur.

We have made a detailed study of the tidal evolution history of these binaries through integration of the relevant differential equations using the formalisms by Zahn as well as Tassoul. Our results show that a satisfactory explanation of the synchronization status of the component stars can be achieved when the influence of the rapid expansion phases, suffered by the stars after leaving the main sequence and starting core He combustion, in the actual rotational velocities is taken into account.