

Circularization in B-type Eclipsing Binaries in Both Magellanic Clouds

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Making use of detached eclipsing binaries with B-type components discovered by the OGLE and MACHO teams in the SMC and in the LMC, we give the value of the fractional radius above which circularization occurs. This critical radius is around 0.24 to 0.26, regardless of the mass, surface gravity or metallicity, and is consistent with that found by Giuricin et al. (1984) for galactic binaries. These empirical facts are shown to be consistent with Zahn's (1975) theory of tidal dissipation. This work confirms and extends that of North & Zahn (2003), thanks to a sample of 448 binaries taken from the recent OGLE catalogue of 2580 eclipsing binaries in the LMC (Wyrzykowski et al. 2003) and a more homogeneous interpretation of the lightcurves of the 148 SMC binaries.

As a by-product of this study, we provide approximate stellar parameters of the average component of 148 binaries in the SMC and of up to 353 binaries (some of which might be non-detached) in the LMC, under the assumption of equal components, known distance and average absorption towards the Magellanic Clouds. These parameters are available at the address <http://obswww.unige.ch/~north/DEBs/>.

References

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