

A Statistical Study of Spectroscopic Binaries Containing A Late-Type Giant Star

H.M.J. Boffin¹
 Institut d'Astrophysique
 Université Libre de Bruxelles

¹ Boursier I.R.S.I.A.

Binarity seems to be a feature shared by various classes of Peculiar Red Giants (PRG). This observational fact has led to the general agreement that those stars result from a mass transfer originating from an asymptotic giant branch companion star.

To discover which of the two mass exchange scenarios (i.e., a stellar wind or Roche lobe overflow) actually operates necessitates a careful study of the PRG's orbits. That study should compare the orbital parameters of PRG's with those of normal red giants. Understanding the behaviour of so-called normal stars is thus a pre-requisite to the study of the distribution of the PRG's orbital elements distribution. To this end, have we constructed, from the available literature, a catalogue of 195 spectroscopic binaries containing at least one late-type giant. From a statistical study of this catalogue can we extract some data of high interest in view of the comparison with a sample of PRGs orbits.

We deduce the following mean values from our catalogue:
 $\langle P \rangle = 1098 \pm 232$ days, $\langle e \rangle = 0.205 \pm 0.015$, $\langle e^2 \rangle = 0.09 \pm 0.01$,
 $\langle f(M) \rangle = 0.124 \pm 0.015 M_{\odot}$.

The well-known orbital period-eccentricity correlation (physically (un)meaningful?) is also present in our sample and can be written $\langle e \rangle \approx 0.16 \log P - 0.16$.

Other statistical properties are given, namely the distributions of eccentricity, period and mass function. We also attempt to determine the distribution of the mass ratio in such systems.