Dense circumstellar nebulae in wide binary central stars

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Detection of close binary central stars with periods of less than a day is now well-tested and routinely possible via photometric monitoring. For wide binary central stars with periods of weeks to years detection techniques are still in their infancy. Radial velocity monitoring programs are yet to be applied to very large samples and the method suffers from large systematic errors as well as intrinsic wind variability. One alternative we are exploring is the detection of dense circumstellar nebulae residing around a wide companion. The archetype of this class is EGB6 as revealed by HST imaging (Bond 2009). Here we present spectroscopic evidence for other EGB6-like central stars and discuss their relationship to symbiotic stars. A probable 12.5-day irradiated binary is also presented to demonstrate the limits of the photometric monitoring technique.
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\begin{abstract}


Abstract Introduction: Identification of close binary central stars (CSPN) with periods \( \leq 1 \) day via photometric monitoring is non-trivial and they make up \( \sim 1\% \) of all CSPN. At orbital periods larger than \( 10^3 \) days the time-scale effect becomes very weak (see MPA 1508-6455 panel at right). Besides NGC 2346 and Cassioli et al. (1999) binaries, there is essentially no information about binaries at \( P \) \( > 10^3 \) days, so for convenience we group them together under wide binaries. In this regime \( (10^3-10^4) \) days periods can be measured with radial velocity (RV) monitoring, but current studies are problematic. Targets are bright and undersampled, while sensitivity is reduced by large systematic errors and intrinsic wind variability.

\end{abstract}

\begin{figure}

\begin{center}

\includegraphics[width=\textwidth]{figure1.png}

\caption{Example of wide binary with large period.}

\end{center}

\end{figure}

\begin{acknowledgements}


Acknowledgements We suggest PHR 0905 as a MASH-PN with an atypical F giant CSPN. Miszalski (2009) found a period of 0.31 days from ASAS, but to avoid breakup of the F giant we must consider PHR 0905 as a close binary so it is a likely wide binary.

\end{acknowledgements}

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References

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