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Get this from a library! Active Close Binaries. [Cafer AˆbanoÄŸlu] -- Since the s symposia or colloquia devoted to recent research on close binaries have been held around the world almost annually.

The primaries of four five? Three subgiant binaries AR Lac, SZ Psc and RT Lac have spots on both components, with pronounced active longitudes at the substellar points, and at other longitudes as well. In case of main sequence systems probably their common magnetic field, for giants the tidal force, and, for subgiants both forces together, determine the positions of the active longitudes. Close binaries with active longitudes In order to get a significant sample of spot position in a star to find out if there is any clustering of spots at certain stellar lon- gitudes, long-term, continuous observations and modelling is necessary. The longest, already enough accurate datasets are photometric, dating back to the s. Fortunately, the most stable parameter of the photometric modelling results is the spot longitude, which is directly determined by the shape of the observed light curve cf. Therefore, all modelling results from the past 15â€”20 years are useful and suitable for our study. Nine of the close binaries are eclipsing, and three of them are composed of a giant primary and of an unknown secondary. It is not possible to cite all papers dealing with these objects, rather we mention only the most significant sources of information that were used in the present study. Four binaries are composed from two main sequence stars: RT And has the short- est period of these with photometric information dating back to Series of spot models were secured by Zeilik et al. Similarly, Zeilik et al. The results again show spots on the primary, prefer- ring the quadrature positions. The same results with spots at quadratures were achieved for BH Vir for data starting in Zeilik et al, a; Kjurkchieva, et al. UV Psc is composed of a main sequence and a subgiant component, or, just of two main sequence compo- nents, and similarly to the main sequence binaries it has spots at the quadratures Kjurkchieva et al. The next four eclipsing binaires form a heterogeneous group with spectral types of F to K subgiants. One of the longest photometric dataset exists for RS CVn itself, which were thoroughly modelled by different authors and methods. The re- sults show spots on the later component placed almost every- where on the stellar surface at different times. Note the two stable spotted regions near the substellar point and opposite the epoch of the orbit is at the time of the maximum positive velocity systems. Another common feature is, that spots have preferred longitudes on the substellar points of both stars of the binaries, i. Additionally, in some cases active longitudes are found on the antipodes, and, occasionally, on quadratures, and other longitudes as well. The last three binaries of the sample are early K giants with unknown secondaries. The observations of HK Lac date back to and with a few interruptions are continuing to date, whereas data on IM Peg are from onwards. On these two very similar giants two preferential longitudes exist, which are the substellar point and opposite to it. As an example see the folded light curve of UZ lib from 11 consecutive years, in Fig. Magnetic model in close binaries Following the solar paradigm we suppose that starspots are of magnetic origin, appearing at the place of the stellar surfaces where, rising from the bottom of the convection zone, flux tubes erupt. Several studies deal with modelling the flux tube eruptions depending on the strength of the magnetic field, on the depth of the convection zone, on the rotational rate, etc. However, not much has been done for modelling the 1 1. Different symbols denote the binaries with typical places of the active longitudes behaviour of the emerging flux tubes in the force field of a binary system. The first modell on RS CVn itself suggested interconnecting magnetic loops between the components as well Uchida and Sakurai, Their mod- ell shows that the existence of active longitudes depend on the emergence latitudes of the flux tubes, and on the strength of the magnetic field. However, to date only simplified, main sequence modells exist. Our intention is thus to give a hint from the observational point of view, of what may determine the positions of the active longitudes in close binaries. Discussion In a close binary system two main forces affect the place of the flux tube eruption on the stellar surfaces, and Springer Astrophys Space Sci Symbols as in Fig. The question is, which one of these two forces dominate in the different types of close binaries? Figure 2 shows the size of the orbit a in the function of the period trivial and of the mass function of the systems. Demircan suggested 15 years ago, that stellar activity may depend on q and on the size of the orbit as well. Our results, displayed in Fig. Next, we plotted the

positions of the components of the sample on the Hertzsprung-Russell Diagram, together with evolutionary tracks from Schaller et al. As a conclusion we find, that in case of evolved stars, with smaller surface gravity, the tidal forces dominate, thus the active longitudes prefer the substellar point and the opposite side of the star. Near the main sequence, where the stars have high surface gravity, probably the effect of the common magnetic field dominates, resulting active longitudes at quadrature position. For subgiants, the two effects may be balanced, thus active longitudes, beside the substellar points, appear almost anywhere on the surface. What we present here is just an idea, drawn from long-term observations and modelling of twelve close binaries of different types. More long-term studies and detailed theoretical modelling is necessary however, to arrive at a more firm conclusion about the positions of active longitudes on stars in close binary systems. AJ, Holzwarth, V. AN, Pagano, I. Unstable current systems and plasma instabilities in astrophysics, Proceedings of the 11th Symposium, College Park, MD, August 24-28, 1991, ApJ, Zeilik, M. ApJ, Springer Recommended.

2: ASTRONOMY AND ASTROPHYSICS Environments of active close binaries - CORE

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3: Active Longitudes in Close Binaries - [PDF Document]

The light variations of close binaries, excluding the changes from eclipses, were addressed by two different models: i) Photometric effects by oscillating components, and ii) Star-spot and other surface inhomogeneities on close.

4: Interacting Binaries | UW-Madison Astronomy

For more than a decade, a group of astronomers at Ege University Observatory has been concentrating on active close binaries with particular emphasis on the behaviour of the light curves of chromospherically active systems.

5: CiteSeerX Environments of active close binaries I

Since the symposia or colloquia devoted to recent research on close binaries have been held around the world almost annually. At meetings of the General Assembly of the International Astronomical Union this topic has also been discussed in detail at presentations in various commission.

6: CiteSeerX Environments of active close binaries II

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