ON THE ROLE OF DK AND DM STARS IN PILING UP THE TOTAL MASS OF STAR CLUSTERS

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1. Red Dwarfs in the Solar Vicinity

Although many projects were aimed at identifying nearby red dwarfs, the catalogues may be complete up to a limiting distance of 5 pc only and may be reliable to 10 pc . From recent observations it is evident that their absolute visual brightness (M_V) ranges from about 6 to at least 18.5 what means that an average dK0 star is at least 100,000 times brighter than red dwarfs of the latest spectral subclasses. The photon detecting efficiency of our instruments is to be increased that these can measure late dM stars from the same distance from which dK stars can be analysed now. **Another solution is offered by the flare-active red dwarfs which may be 1000 times brighter during their flare ups than usually.**

It is known (cf.Rodonó 1986) that the mass range of the dwarfs extends from about $0.07M_\odot$ to $0.7M_\odot$ and that K-type main sequence stars may reach $0.8M_\odot$. These seemingly low values may suggest that red dwarfs are negligible contributors to the total mass of the Milky Way. In spite of that the incredibly high percentage of red dwarfs among the stars of the Galaxy (about 87% in the solar vicinity, cf.Benest 1983) shows, that these tiny objects may be the most generous donors to its total mass.

2. Red Dwarfs in the Open Clusters

There are only a few open clusters with reliable membership data including red dwarf cluster members too. The farthest of all is most probably the *Pleiades*, which has long been scrutinized also for its variables (Szécsényi-Nagy 1990a), especially for flare stars. More than 500 objects of this type have been discovered in a rather limited field of the cluster. These red dwarf stars are concentrated in the central part of M45, a very important fact,

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which clearly demonstrates that *these flare stars are physically associated with the cluster itself*. Albeit membership probabilities published for some of these stars are inconsistent, it is likely that the flare stars were also born in company with the other (more luminous) members of the system.

Based on results of more than 3000 hours of photometric observations it was possible to calculate that almost 70% of the flare stars of the core of the cluster had been catalogued and that *the whole volume of the Pleiades system contained 1000 or even more flare-active red dwarfs* (Szécsényi-Nagy 1990b). Adopting $0.4M_\odot$ for the mean mass of dM stars and $0.75M_\odot$ for that of K dwarfs, **the combined mass of the flare star subsystem of the Pleiades must fall in the 450 $M_\odot$ - 500 $M_\odot$ mass range, and the total mass of M45 is about twice as large as the value derived from previous star counts.**

3. dK/dM Stars in Globular Clusters

It is known that the shape of the faint end of the stellar luminosity function is the same everywhere in the Galaxy. Furthermore, since massive stars evolve very quickly, younger clusters are more rich in bright and high-mass blue/white stars, and in older systems the red dwarf population may have definitely higher relative weight in the combined mass of the cluster. It may happen that *the relative mass density of dK/dM class stars in globular clusters (GCs) exceeds the value derived for the much younger open clusters and that of the solar vicinity.* Although this conclusion is probably correct, it is lacking in observational evidences. Until now it has been practically impossible to find any red dwarf members of GCs because of the huge distance moduli of these objects. Late dM stars of GCs remained unobservable and unidentifiable but we have to try to catch late K or early M dwarfs of the nearest clusters, while **the discovery of flare stars in GCs would be a true sensation allowing the extension of the level of activity vs. age relation for these kind of objects.**

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