

MASSIVE UNSEEN COMPANIONS TO HOT FAINT UNDERLUMINOUS STARS FROM SDSS (MUCHFUSS)

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Most recent results of the ongoing MUCHFUSS project (Massive Unseen Companions to Hot Faint Underluminous Stars from SDSS) are presented. Hot subdwarf stars (sdBs) are core helium-burning stars located at the extreme blue end of the horizontal branch. The formation of these stars is still poorly understood and requires high mass loss in the red giant phase. After the helium-burning phase hot subdwarfs evolve directly towards the WD cooling tracks. About half of the known sdBs reside in close binary systems with unseen companions and are most likely formed via common envelope ejection. Hot subdwarfs with massive white dwarf companions are possible candidates for SN Ia progenitors. Furthermore systems with unseen neutron star or even black hole companions are predicted by binary evolution theory and candidate systems have been found recently. In order to search for sdBs with massive compact companions we selected hot subdwarf stars with high radial velocities and/or RV variabilities from the SDSS spectral database and conducted a survey to identify more RV variable systems. In a multisite follow-up campaign starting in 2009 we obtain time resolved spectroscopy to derive the orbital parameters of the binaries as well as light curves to search for indicative features like eclipses or reflection effects. We present orbital solutions for several sdB binaries with white dwarf companions. As it turned out, our selection criteria not only single out binaries with massive compact companions, but also very short period systems with low mass and possibly substellar companions. In this way we discovered an eclipsing binary most likely consisting of a He-WD progenitor and a brown dwarf.