N17a Pulsations in massive stars

Godart Melanie (University of Tokyo) et al.

Massive stars are essential components of the Universe that have always been the subject of large interest in the community. Significant advances in the understanding of their formation and evolution have been made recently but these topics are far for being completely understood. A powerful way to improve our understanding is to study the stellar pulsations. Recent ground-based and space observations have shown the presence of such pulsations in massive main sequence stars (i.e. during the core hydrogen burning phase) and in post-main sequence stars: acoustic and gravity modes excited by the κ-mechanism and solar-like oscillations. Theoretical studies emphasized the presence of strange modes in massive models, excited by the strange mode instability mechanism. A strange mode candidate has been observed in a hot supergiant star (Aerts et al. 2010). Moreover, recent theoretical analyses have shown that hot supergiants can also pulsate in oscillatory convective modes propagating in the superficial layers (Saio et al. 2011). Since their excitation mechanism is related to convection, the treatment of convection should alter it and modify the instability region. Sonoi et al. 2013 have recently investigated that point into more details. We present here the instability domains of massive stars as well as their excitation mechanisms computed with the ATON evolutionary code (Ventura et al. 2008) and/or the CLES evolutionary code from Liege (Scuflaire et al. 2008a). Adiabatic and non-adiabatic computations are performed by the OSC oscillation code from Liege (Scuflaire et al. 2008b) and the MAD non-adiabatic code (Dupret et al. 2003). These results will then be compared to the other recent analysis.