Strange mode instability for micro-variations in Luminous Blue Variables

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If a massive star has lost significant mass during its red-supergiant stage, it would return to blue region in the HR diagram and spend a part of the core-He burning stage as a blue supergiant having a luminosity to mass ratio (L/M) considerably larger than about 10^4 (in solar units); the duration depends on the degree of internal mixing and on the metallicity. Then, various stellar pulsations are excited by enhanced kappa-mechanism and strange mode instability. Assuming these pulsations to be responsible for (at least some of) the quasi-periodic light and radial-velocity variations in alpha Cygni variables including luminous blue variables (LBVs; or S Dor variables), we can predict masses and surface compositions for these variables, and compare them with observed ones to constrain the evolutionary models. We discuss radial pulsations excited in evolutionary models of an initial mass of 40 M_odot with solar metallicity of Z=0.014, and compare them to micro-variations in the two Galactic LBVs, HR Car and HD 160529. We have found that these stars should has lost more than half of the initial mass and their surface CNO abundances should be significantly modified from the original ones showing partial H-burning products.

Reference: Fujiwara Seminar "Progress in Physics
of the Sun and Stars: A New Era in Helio- and Asteroseismology" 26 - 29 Nov. 2012, Hakone, Japan
Status: Conference proceedings

Weblink: http://arxiv.org/abs/1305.4728

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