The Eddington Limit, Radiative Instabilities and the Declines of R Coronae Borealis Stars

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The trigger mechanism for the famous declines of R Coronae Borealis stars may be found *in* the photospheres of the stars. Recently constructed model atmospheres show gas pressure inversions in deep layers ($\tau_{\rm Ross} \approx 10$), which is equivalent to the stellar luminosity locally exceeding the opacity-modified Eddington limit (Asplund et al. 1997, *A & A*, 318, 521). Observed parameters of R CrB stars fall very close to and along the computed Eddington limit, which suggests that there is indeed a relationship between the limit and the declines of R CrB stars. The similar hydrogen-deficient carbon stars, which do not show any declines, have therefore probably not yet reached the Eddington limit. In the present poster a radiative instability is presented which may eject gas clouds from the stellar surface due to the super-Eddington luminosities and the opacity dependence on temperature and density. The ejected gas will cool very rapidly both radiatively and adiabatically to conditions possibly favoring dust condensation, much the same way as described in Woitke et al. (1996, *A & A*, 313, 217), and thereby possibly causing a decline. Typical timescales for the instability are discussed, and the conditions under which the gas pressure inversion disappears and instead a continuous stellar wind is initiated are investigated. Observational consequences, such as high-velocity absorption components even at maximum light, are outlined.

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