6Li/7Li isotopic ratio in the most metal-poor binary CS22876-032

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The 6Li isotope is believed to be a product of the interaction of Galactic cosmic rays (GCR) with the interstellar medium, where the 6Li abundance increases with increasing metallicity similarly as has been found for B and Be (see e.g. Prantzos 2012). Detecting 6Li at low metallicities may suggest other production channels like e.g. non-standard physics in the Big Bang (Jedamzik & Pospelov 2009), or pre-galactic origin (Rollinde et al. 2006).
The presence of 6Li in metal-poor halo stars is usually derived from a tiny asymmetry in the red wing of the 7Li doublet line at 670.8 nm. Using 1D model atmospheres and LTE spectral synthesis, Asplund et al. (2006) claimed the detection of 6Li in several stars at [Fe/H] < -2.
However, Cayrel et al. (2007) pointed out that convective flows in the atmospheres of metal-poor stars are probably the responsible of this asymmetry. The re-analysis of the Li feature, using 3D hydrodynamical models and a 3D-NLTE treatment, in some metal-poor stars was not able to confirm the detection of 6Li (Steffen et al. 2012; Lind et al. 2013).
We have obtained a high-resolution (at R~110,000) and high-quality (at S/N~580) spectrum of the most metal-poor binary CS22876-032 ([Fe/H] ~ -3.7). The Li abundances of both binary stellar components have been already reported, but only the primary star has a Li abundance at the level of the Spite plateau (see González Hernández et al. 2008). In this talk I will show the results and the implications of the analysis of the 6Li/7Li isotopic ratio in the Li 670.8nm line using 3D-NLTE tools.

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