
Discovery of a weak magnetic field in the Am star Alhena

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Abstract

Magnetic fields in hot stars play an important role. However, the magnetic properties in these stars are not well known. About 7% of hot stars host a stable, often dipolar, magnetic field with a dipolar field strength above 100 G. In these stars, the magnetic field is of fossil origin. In addition, ultra weak magnetic fields (with a longitudinal field below 1 Gauss) have been discovered in the normal A star Vega and in some Am stars. Theories to explain the dichotomy between the "strong" and ultra weak magnetic fields are based on the stability of the magnetic field. However, the Zeeman signatures observed in the Am stars are not those expected from the normal Zeeman effect: they show a positive prominent lobe without negative lobe.

In the frame of the BRITE spectropolarimetric survey, we discovered a weak magnetic field in Alhena (gamma Gem). Alhena is an eccentric binary system: the primary is a subgiant Am star and the secondary is a weak cool star. The magnetic field comes from the primary: it is the first detection of a normal Zeeman signature in a Am star. Its longitudinal field strength is slightly stronger (a few Gauss) than in the other Am stars.

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