Asteroseismic estimate of helium abundance of 16 Cyg A,B

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Abstract

16 Cyg A and B are among the brightest stars observed by Kepler. What makes these stars interesting is that they are solar analogs that exhibit solar-like oscillations. We use the oscillation frequencies of these stars obtained using 2.5 years of Kepler data to determine the current helium abundance in the envelopes of these stars. We use the oscillatory signal from the acoustic glitch due to HeII ionization zone for this purpose. The amplitude of the oscillatory signal is calibrated using stellar models with varying helium abundance to determine the helium abundance in these stars. The helium abundance in the envelope of 16 Cyg A is found to lie in the range 0.231 to 0.251 and that of 16 Cyg B lies in the range 0.218 to 0.266.

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