

On the incidence of magnetic fields in slowly-pulsating B, β Cephei and B-type emission line stars

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We have obtained 40 high-resolution circular spectropolarimetric measurements of 12 slowly-pulsating B (SPB) stars, 8 Beta Cephei stars and two Be stars with the ESPaDOnS and NARVAL spectropolarimeters. The aim of these observations is to evaluate recent claims of a high incidence of magnetic field detections in stars of these types obtained using low-resolution spectropolarimetry by Hubrig (2006), Hubrig (2007) and Hubrig (2009). The precision achieved is generally comparable to or superior to that obtained by Hubrig et al., although our new observations are distinguished by their resolution of metallic and He line profiles, and their consequent sensitivity to magnetic fields of zero net longitudinal component. In the SPB stars we confirm the detection of magnetic field in one star (16 Peg), but find no evidence of the presence of fields in the remaining 11. In the Beta Cep stars, we detect a field in ξ^1 -CMA, but not in any of the remaining 7 stars. Finally, neither of the two B-type emission line stars shows any evidence of magnetic field. Based on our results, we conclude that fields are not common in SPB, Beta Cep and B-type emission line stars, consistent with the general rarity of fields in the broader population of main sequence B-type stars.

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