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The MiMeS sample of Be stars

The Magnetism in Magnetic Stars (MiMeS) survey made spectropolarimetric observations of hundreds of B-type stars. This sample included about a hundred stars classified at classical Be stars: stars that, at some point in time, showed evidences for a Keplerian disk. The general incidence of magnetism in massive stars is about 10%. Therefore in this sample of Be stars, about 10 new magnetic stars should have been discovered: however, none were.

This is not surprising, from a theory point of view: (i) magnetic field have been shown to force circumstellar material into co-rotation with the stellar stellar surface and (ii) a sudden onset of surface magnetic field has been shown to disrupt a pre-existing Keplerian disk very quickly.

This said, there are inherent challenges in the detection of magnetic fields at the surface of Be stars: they are fast rotators, and the emission from the disk contaminates the spectrum, making the polarization measurements more difficult to interpret. While the design of the MiMeS survey attempted to correct for the former with larger exposure times, it is not clear a priori how much the latter might have impacted our ability to detect magnetic fields in Be stars.

We would like to present the analysis of the sample of Be stars in the MiMeS survey, using (i) uncontaminated spectral lines and (ii) a hybrid method by which we use a synthetic spectral model to mitigate the disk contamination. We compute detection upper limits, for both methods, using a Bayesian methodology. Our aim is to compare these upper limits that of the MiMeS sample of normal B-type stars, and determine whether or not the 0% incidence of magnetism in Be stars is, observationally, compatible with the 10% general incidence for magnetism in massive stars.