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Magnetic field detections in Herbig Ae SB2 systems

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Abstract. Studies of the presence of magnetic fields in Herbig Ae/Be stars are extremely important because they enable us to improve our insight into how the magnetic fields of these stars are generated and how they interact with their environment, including their impact on the planet formation process and the planet-disk interaction. We report new detections of weak mean longitudinal magnetic fields in the close Herbig Ae double-lined spectroscopic binary AK Sco and in the presumed spectroscopic Herbig Ae binary HD 95881 (Järvinen *et al.* 2018) based on observations obtained with HARPSpol attached to ESO's 3.6 m telescope. Such studies are important because only very few close spectroscopic binaries with orbital periods below 20 d are known among Herbig Ae stars. Our detections favour the conclusion that the previously suggested low incidence (5-10%) of magnetic Herbig Ae stars can be explained by the weakness of these fields and the limited accuracy of the published measurements. The search for magnetic fields and the determination of their geometries in close binary systems will play an important role for understanding the mechanisms that are responsible for the magnetic field generation.

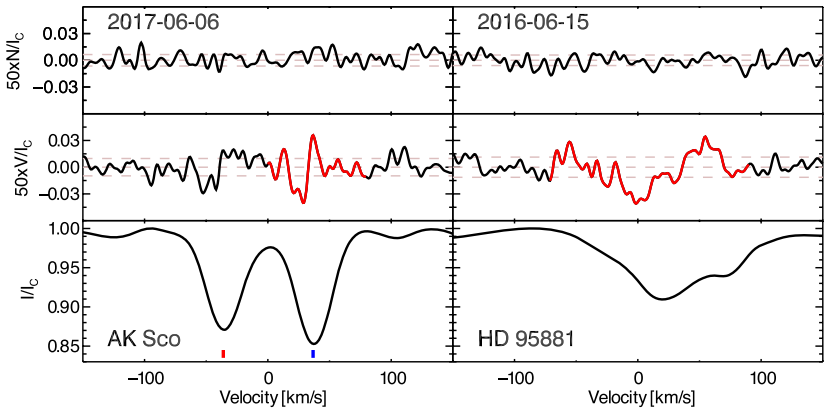

Figure 1. Examples of Singular Value Decomposition (SVD) Stokes I (bottom) and V (middle) as well as diagnostic null (N) profiles obtained for the Herbig SB2 systems AK Sco and HD 95881. The horizontal dashed lines indicate the average values and the $\pm 1\sigma$-ranges. The primary component of AK Sco is marked with a red and the secondary with a blue tick (Järvinen *et al.* 2018).

Reference

Järvinen, S.P., *et al.* 2018, *ApJL*, 858, 18