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Observations of magnetic fields in Herbig Ae/Be stars

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Abstract. Models of magnetically driven accretion reproduce many observational properties of T Tauri stars. For the more massive Herbig Ae/Be stars, the corresponding picture has been questioned lately, in part driven by the fact that their magnetic fields are typically one order of magnitude weaker. Indeed, the search for magnetic fields in Herbig Ae/Be stars has been quite time consuming, with a detection rate of about 10% (e.g. Alecian *et al.* 2008), also limited by the current potential to detect weak magnetic fields. Over the last two decades, magnetic fields were found in about twenty objects (Hubrig *et al.* 2015) and for only two Herbig Ae/Be stars was the magnetic field geometry constrained. Ababakr, Oudmaijer & Vink (2017) studied magnetospheric accretion in 56 Herbig Ae/Be stars and found that the behavior of Herbig Ae stars is similar to T Tauri stars, while Herbig Be stars earlier than B7/B8 are clearly different. The origin of the magnetic fields in Herbig Ae/Be stars is still under debate. Potential scenarios include the concentration of the interstellar magnetic field under magnetic flux conservation, pre-main-sequence dynamos during convective phases, mergers, or common envelope developments. The next step in this line of research will be a dedicated observing campaign to monitor about two dozen HAeBes over their rotation cycle.

References

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