Magnetic Coupling between Hot Stars and their Radiatively Driven Winds and Decretion Disks

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Spectropolarimetric techniques have led to detection of strong dipole magnetic fields in several hot, early-type stars. Using a combination of analytic and numerical MHD models, this talk will focus on the role of such magnetic fields in channelling, and sometimes confining, the radiatively driven mass outflows from such stars. In particular, I discuss how the resulting "magnetically confined wind shocks" (MCWS) can explain the moderately hard X-ray emission seen from the O7V star Theta-1 Ori C, and how the trapping of material in a "rigidly rotating magnetosphere" (RRM) can explain the periodically modulated Balmer line emission seen from the magnetic B2pV star sigma Ori E. I also discuss how magnetic reconnection heating from episodic centrifugal breakout events might also explain the occasional very hard X-ray flares seen from the latter star.