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Cross helicity, spectral anisotropy and turbulent heating in fast and slow winds

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Slow and fast winds show both slow proton cooling with distance, although they show different spectral anisotropies and cross helicities. We investigate whether this can be numerically reproduced in the distance range 0.2 and 1 AU, continuing the work of Verdini Grappin 2016 and Montagud-Camps et al 2018. We use the expanding box model, i.e., direct simulations of the MHD equations including wind expansion. We find that two robust classes of anisotropy exist, determined by the initial cross-helicity and anisotropy, while the resulting slow-down of proton temperature is comparable in the two cases to the proton temperature evolution observed in both slow and fast winds.