
A Wrinkle in Timing: Core-Envelope Decoupling and Gyrochronology

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Abstract

The spin down of low mass stars is a potent diagnostic of their age. However, cluster stars exhibit "stalled spin down", a phase where the usual decay of rotation is slowed or halted. This phenomenon, first recognized as a brief phase for solar analogs, is longer and more pronounced for lower mass stars. A leading theoretical interpretation is core-envelope decoupling, where the apparent stalling is caused by a delay between the spindown of the envelope and the response of the core. In this poster I present evidence that Prasepe stars exhibiting stalled spindown have anomalous star spot filling factors and are highly magnetically active. This strongly supports core-envelope decoupling, and I show that starspot measurements are important calibration tools for spin down models. I provide evidence that this is a significant effect that should be accounted for in PLATO age estimates from gyrochronology, and highlight interesting possible implications for stellar dynamos.

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