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**Modeling Convection and Differential Rotation in Stellar Dynamos**[1] CHARLES PAYNE, CAMERON SORENSEN, NICHOLAS NELSON, Cal State Univ-Chico — According to gyrochronology, older sun-like stars have rotation rates that are slower than the suns current rotation rate due to a loss of angular momentum over time. As stars age, they can exhibit changing characteristics like altered dynamo action or frequency of coronal mass ejections or solar flares which are inherently connected to the rotation rate of the star. These changing characteristics can directly affect the environments of the planets that orbit the star, which illustrates the vital role of stars in determining the habitability of exoplanets. Using the magnetohydrodynamic (MHD) code called RAYLIEGH, which solves the MHD equations for a 3 dimensional rotating shell, we observed the hydrodynamics of the convection zone of these slower rotating sun like stars. Our results show solar like behavior at the current solar rotation. As we decrease rotation rate, we see the differential rotation weaken and then reverse. Our simulations also show that with increased diffusion there is decreased rotational influence on convection and hence anti-solar rotation.

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