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Modeling Convection and Differential Rotation in Stellar Dynamos II[1] CAMERON SORENSEN, CHARLES PAYNE, NICHOLAS NELSON, California State Univ-Chico — Stellar variability is a key physical process that determines the potential habitability of planets. Stellar magnetism drives variability on short to moderate timescales by generating magnetic spots, which lead to explosive events such as flares and decadal variations due to activity cycles. By studying our Sun's magnetic activity we can then see how other stars' magnetic activity might affect their planets' habitability. Stellar magnetism comes from the convection and rotation deep in the stars interiors. These magnetic fields can then rise to the photosphere where they are observed as sunspots. Rotational influences on deep convection then leads to differential rotation. We present simulations of the convective zones of sun-like stars using the Rayleigh code. Our simulations explore the impact of changing the level of the rotational constraint either by increasing the level of turbulence or by decreasing the rotational rate. Our simulations achieve solar-like differential rotation for solar-like conditions, however we also find that the stars with slightly less rotational constraint experience a clear change in their differential rotation profiles from solar-like (fast equator, slow poles) to anti-solar (slow equator, fast poles).

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