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Convective Origins of Active Longitudes on Solar-like Stars MARIA WEBER, Colorado State Univ, YUHONG FAN, MARK MIESCH, High Altitude Observatory — Using a thin flux tube model in a rotating spherical shell of turbulent, solar-like convective flows, we find that the distribution of emerging flux tubes in our simulation is inhomogeneous in longitude, with properties similar to those of active regions on the Sun and other solar-like stars. The large-scale pattern of flux emergence our simulations produce exhibits preferred longitudinal modes of low order, drift with respect to a fixed reference system, and alignment across the equator at low latitudes. We suggest that these active-longitude-like emergence patterns are the result of columnar, rotationally aligned giant cells present in our convection simulation at low latitudes. If giant convecting cells exist in the bulk of solar and stellar convection zones, this phenomenon, along with differential rotation, could in part provide an explanation for the behavior of active longitudes.

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