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Stellar Rotation in Praesepe's Tidal Tails JESSICA MCDIVITT, STEPHANIE DOUGLAS, Lafayette College, JASON CURTIS, Columbia University / American Museum of Natural History, MARK POPINCHALK, City University of New York / American Museum of Natural History, ALEJANDRO NUNEZ, Columbia University — As open clusters orbit, gravity distorts the cluster, stripping stars from its core and forming tidal tails. Recent studies have identified candidate tidal tail members whose former membership in the cluster core can be verified through analysis of stellar rotation periods. Magnetized stellar winds slow a star's rotation over time. Consequently, in open clusters like Praesepe, stars tend to exist on either a fast or slow rotator sequence following a pattern unique to that cluster's approximate age. A cluster's color-period plot can serve as an age indicator, and tidally stripped stars should follow the same distribution as stars in the cluster core. We select 96 candidate tidal tail members observed by the Transiting Exoplanet Survey Satellite (TESS). We use a Python GUI to extract and detrend light curves, and to measure rotation periods. We measured reliable rotation periods for 32 stars, while 64 light curves had inhibiting systematic issues. By comparing the TESS periods for our targets to published K2 periods for members in the cluster core, we conclude that our 32 new rotators are consistent with past membership in the Praesepe cluster. Based on this success, we suggest that stellar rotation offers an effective method for confirming past members dispersed into tidal tails.

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