
Rotation and Differential Rotation of the active Kepler stars

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Abstract

The Kepler space telescope monitors more than 160.000 stars with an unprecedented precision providing the opportunity to study stellar variability of thousands of stars. We present rotation periods for thousands of active stars in the Kepler field. In most cases a second period close to the rotation period has been detected which we interpret as surface Differential Rotation (DR). We show how the absolute and relative shear correlate with rotation period and effective temperature. To detect different periods in the light curves we use the Lomb-Scargle periodogram in a prewhitening approach to achieve parameters for a global sine fit. The most dominant periods are associated to different surface rotation periods. Since most light curves are dominated by several periods we conclude that DR is very common in active stars. Our results match observations and theoretical models fairly well. This is the first time that DR has been measured for such a large number of stars.

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