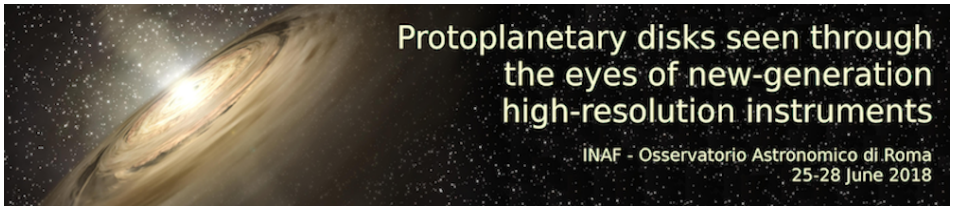

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Accretion variability in young, low mass stars (I)

Tuesday, 26 June 2018 11:10 (30 minutes)

We present and discuss the manifold photometric behaviors of young, low-mass stars with active accretion disks. This review is based on results from recent space-borne missions, most notably CoRoT and Kepler/K2. Thanks to their sub-1% photometric precision, sub-hour time sampling, and continuous time coverage for spans of weeks to months, these campaigns have provided first detailed atlases of the short- to mid-term variability of young, disk-bearing stars. Distinct variability types identified include the bursters (with stochastic, short-lived brightening events), the dippers (with recurring or aperiodic fading events), and the quasi-periodic variables. The first class likely reflects unstable disk accretion, with strong mass accretion rates (M_acc), as suggested by complementary UV observations. The other two photometric classes may instead be related to a stable, funnel-flow accretion regime, with more moderate M_acc. While the strength of M_acc variability can vary broadly from object to object, typical M_acc variations amount to <0.1 dex on timescales of hours, and to ~0.5 dex on timescales of days to weeks; the latter persist on timescales of up to several years. Geometric effects linked to rotational modulation can statistically explain a significant fraction (up to 75%) of the observed M_acc variability. This suggests that the global accretion geometry in young stars typically persists over many rotational cycles, although single accretion events may exhibit more erratic behavior on the shorter term.

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Session Classification: Disk accretion and star-disk interaction (chair B. Stelzer)