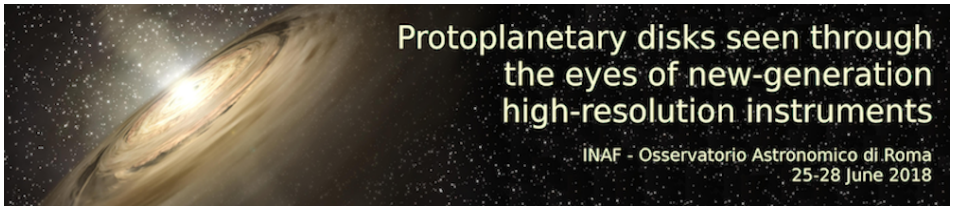

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Modeling the spin evolution of classical TTauri stars

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The spin evolution of classical TTauri stars (CTTS) represents a puzzling problem. Since they are still contracting and accreting, these protostars would be expected to spin-up at breakup speed in a few million years. On the other hand, as soon as they emerge from the Class 0-I embedded phases, they are observed to rotate with periods between 1-10 days, well below their breakup limit. In addition, the evolution of the rotational distribution displayed by open clusters of different ages suggests that the rotation of TTauri stars still surrounded by their accretion disks could stay approximately constant for a few million years. Clearly, an efficient spin-down mechanism is required to explain the spin evolution of CTTS. I will briefly review different models of the magnetic interaction of a slowly rotating protostar with a surrounding accretion disk that have been proposed in the literature to explain the angular momentum evolution of accreting pre-main-sequence stars. I will then use a suitable torque parametrization derived from numerical models of stellar winds and magnetic star-disk interaction to compute the long-term evolution of the stellar angular momentum. These results can be directly compared to the observed evolution of the stellar rotational distribution, providing different constraints to the models and shedding light on our current understanding of the star-disk interaction process.

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