Contribution ID: **4** Type: **not specified**

Thanatology in protoplanetary discs

Tuesday 5 August 2014 11:00 (30 minutes)

The existence of magnetically driven turbulence in protoplanetary discs has been a central question since the discovery of the magnetorotational instability (MRI). Early models considered Ohmic diffusion only and led to a scenario of layered accretion, in which a magnetically dead" zone in the disc midplane is embedded within magneticallyactive" surface layers at distances of about 1–10 au from the central protostellar object. Recent work has suggested that a combination of Ohmic dissipation and ambipolar diffusion can render both the midplane and surface layers of the disc inactive and that torques due to magnetically driven outflows are required to explain the observed accretion rates.

In this talk, I will present recent results revisiting this problem including all three non-ideal MHD effects: Ohmic diffusion, Ambipolar diffusion and the Hall effect. I will show in particular that the Hall effect can "revive" dead zones by providing a large scale magnetic torque in the disc midplane, potentially leading to significant accretion rates. Implications for the global evolution of protoplanetary discs will be discussed.

Author: Dr LESUR, Geoffroy (CNRS/IPAG)

Co-authors: Dr KUNZ, Matthew (Princeton University); Dr FROMANG, Sébastien (Irfu/CEA Saclay)

Presenter: Dr LESUR, Geoffroy (CNRS/IPAG)

Session Classification: Tuesday Morning

Track Classification: Workshop Main Programme