Contribution ID: **31** Type: **Oral**

Dust dynamics in protoplanetary disks: dust evolution timescales and constraints on dust grain size distribution in the dust vertical settlement regions.

Monday 21 October 2019 15:00 (25 minutes)

We propose a cross-disciplinary study of dust dynamics and the observed gas tracers using the VLT-X-Shooter and VLT-CRIRES data (Alcala et al. 2017) in which we will explot that will transfer know-how and methods derived from recent advancements in the field of Solar System investigations to the study of circumstellar discs. It is a theoretical modelling of the dust dynamical evolution in the Epstein regime that will provide a unique perspective of the dust evolution in circumstellar discs and will allow us to explore for the first time how non-spherical dust grains can be injected and sustained in a vertically extended region spanning several AU from the mid-plane. One direct application of the proposed research is the investigation of the dynamics of secondly generated dust, collisionally produced in HD163296 (Turrini et al. 2019). This dust will find itself in a comparatively gas-poor environment and its dynamical evolution will be more similar to that of dust grains in a rarefied gas field (Ivanovski et al. 2017) than to that occurring in the denser mid-plane region. Consequently, a model that simulates such dust dynamics will be able to describe its evolution and to constrain the dust grain size distribution in the dust vertical settlement regions.

References:
Alcala et al. 2017, Astronomy and Astrophysics, Volume 600, id.A20, 42 pp.
Turrini et al. 2019, Astrophyisical Journal, Vol. 877, n.1
Ivanovski et al. 2017, Icarus 282, 333-350

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