Contribution ID: **72** Type: **not specified**

Alice Somigliana - A way to disentangle between viscous and MHD evolution in protoplanetary discs

Monday, 12 June 2023 15:40 (1 minute)

The gaseous component of protoplanetary discs has traditionally been described as undergoing viscous accretion; this picture, however, is being challenged by the observational evidence of levels of turbulence in discs too low to account for the observed evolution. The alternative scenario of MHD disc winds is being explored as potentially able to reproduce the same observed evolutionary features that up to now have been explained with viscosity. Although the two models do lead to different disc properties, to this day none of them has proven to be observationally testable –mainly due to instrumental limitations. Thus, we cannot rule out one or the other model yet, as much as the possibility of both being at play at the same time. In this work, I search for distinctive predictions for the two models that not only we can appreciate from the theoretical point of view, but we can also recognize in the observations. I do so by means of analytical calculations and numerical simulations, performed with my population synthesis code Diskpop. I explore the possibility that signatures of the ongoing evolutionary mechanism may be enclosed in the observed evolution of the correlations between (i) the disc properties and the stellar mass, and (ii) the disc mass and the accretion rate. I find that, while both are theoretically expected to show characteristics peculiar of the considered model, the first does not lead to appreciable differences once convoluted with the observational uncertainties. Conversely, the spread around the disc mass –accretion rate correlation does maintain a distinctive evolution in the two scenarios: I therefore suggest this possible method to disentangle between viscous and MHD theories, laying the ground for future ad-hoc observational surveys.

Session Classification: Posters: 1-minute talks