A glance at young stellar rotators through the eyes of K2 and Gaia

Having observed the Milky Way for more than ten years, the *Gaia* mission will represent a stepping stone for astronomical observations of the coming decades. In particular, a photometric survey such as PLATO will greatly benefit from the previous efforts of stellar characterisation provided by *Gaia*. We therefore want to investigate how *Gaia* observation might be of use for future rotation and activity measurements from PLATO.

To this purpose, we analyse 1063 light curves from the K2 mission where a rotation measurement is available from *Gaia* DR2 or DR3. We compare the recovered periods with the *Gaia* reference values and we validate the measurements for a large fraction of the sample. We put in perspective our sample both with *Kepler* and *Gaia* rotation catalogues. We examine the behaviour of our sample with respect to the correlation index between wavelengths provided by Gaia observations, finding that a larger stellar variability corresponds to a stronger correlation. We finally implement a machine learning strategy to identify in the *Gaia* sample targets that have properties similar to our K2 subsample.