

## **The Gaia-ESO Survey experience with multiple analysis pipelines**

Rodolfo Smiljanic<sup>1</sup>, the Gaia-ESO Survey consortium<sup>2</sup>,

<sup>1</sup>*Department for Astrophysics, Nicolaus Copernicus Astronomical Center, ul. Rzybińska 8, 87-100 Toruń, Poland*

<sup>2</sup>*<http://www.gaia-eso.eu>*

### **Abstract**

For the analysis of the UVES spectra of FGK-type stars in the Gaia-ESO Survey, we implemented 13 parallel methodologies as opposed to adopting one single analysis pipeline. The main advantage of a multiple analysis strategy, in a broad survey like Gaia-ESO, is that we can identify the different pipelines that perform better in different regions of the parameter space. We are therefore not constrained by the limitations of a single pipeline, which would introduce different systematics in different regions of the parameter space. In addition, with multiple analyses we can quantify the precision of the spectroscopic analyses, by reviewing how well the pipelines agree in each star of the sample. Our final parameter scale is built by implementing a homogenization process that ties it to the fundamental scale defined by the Gaia benchmark stars. Homogeneity is ensured by guaranteeing that the final results reproduce the "real" parameters of these reference stars. Here, I will discuss how we use the multiple analyses to define the precision of our results, how the benchmarks are used to define the accuracy of the results, and present the limitations of our approach with emphasis on the analysis of the Gaia-ESO UVES spectra of FGK-type stars.