Blinded by our Sun: Testing solar models likelihood when looking from afar.

Yago Herrera*[1,2], Aldo Serenelli[1,2], Jakob L. Rørsted[3], and Kuldeep Verma[4]

[1]Institute of Space Sciences [Barcelona] – Spain
[2]Institut dÉstudis Espacials de Catalunya – Spain
[3]Department of Physics and Astronomy, Aarhus University [Aarhus] – Denmark
[4]Department of Physics, Indian Institute of Technology (BHU) Varanasi – India

Abstract

We present preliminary results for our study of the "Sun as a star". In this study, we use the Bayesian Stellar Algorithm (BASTA) to fit and compare a variety of solar models grids to a subset of the observational data of our Sun, including helioseismic data, but degraded to the amount and precision of data normally acquired for other distant stars. The fit computes the likelihood distribution of models in a particular grid, in terms of their chi2, for the given observational data constrains.
The models grids were constructed using different combinations of opacity tables available (OPAL, OP, etc) and the latest solar compositions proposed (Asplund et al 2021, Magg et al 2022). This allows us to use the Sun as a benchmark for testing the aforementioned combinations of opacity tables and compositions.

*Speaker