Título/Title:
Sizing up Stars: The Importance of Independent Constraints in Stellar Modeling

Orientador/Supervisor:
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Descrição/Description:
The past few years have witnessed an ever-growing effort being devoted to the testing and development of asteroseismic techniques for the estimation of fundamental stellar properties, namely, the mass, radius, and age. The focus of this recent effort has been placed on the development of uniform data analysis and stellar modeling strategies, as well as on optimizing the precision of asteroseismic inferences. These techniques are now making it possible to estimate precise fundamental properties of increasing numbers of solar-type field stars, for which such information is usually sparse.
The interferometric radius of a star acts as an independent observational constraint that can be used in the optimization procedure of asteroseismic stellar modeling strategies, allowing for unique tests of stellar interiors physics to be made. In anticipation of the wealth of high-quality data on bright stars that will be made available by NASA's TESS mission (due to launch in March 2018), the goal of this project is to predict to what extent the addition of an interferometric radius — as part of the observational constraints in the modeling process — might lead to an improvement on the precision of the derived stellar model parameters. This will be achieved through tests with simulated data that mimic the asteroseismic performance of TESS for solar-type stars.
The outcome of this project will be extremely valuable in that it will inform the need (and requirements) for new interferometric measurements of bright solar type stars. Furthermore, the research output will be incorporated in an article to be submitted to a peer-reviewed, high-impact journal.

Requisitos/Requirements:
Some previous knowledge of computer programming is required, preferably in Python.