Subgiants and Lower Giants in the TESS Continuous Viewing Zones

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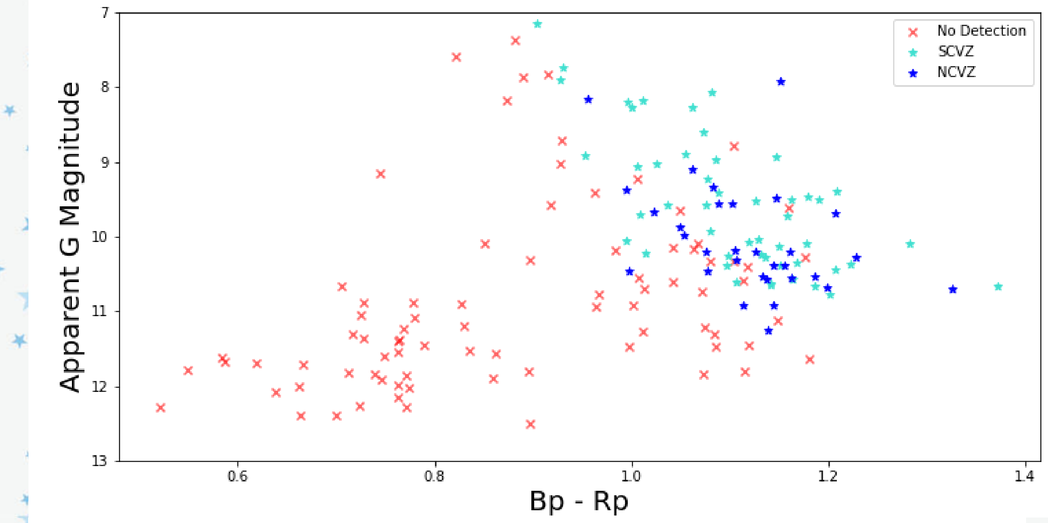
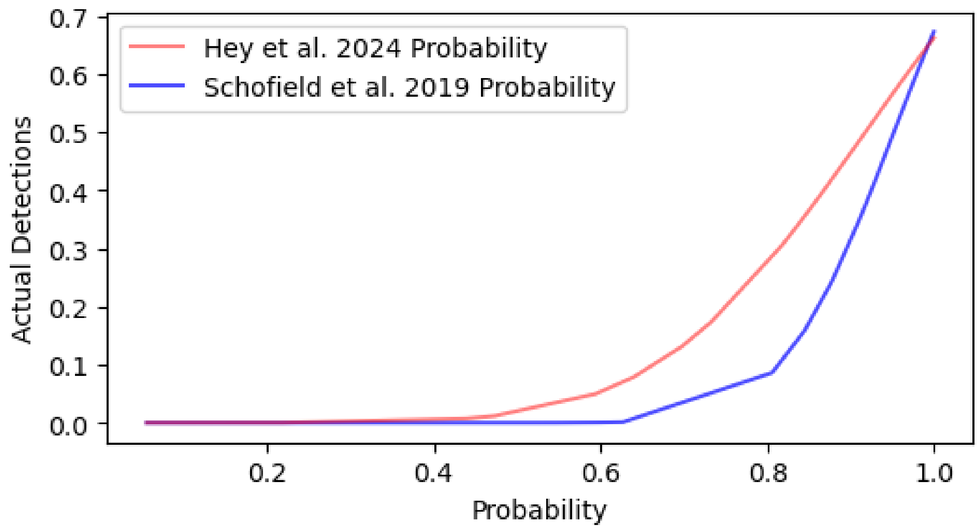
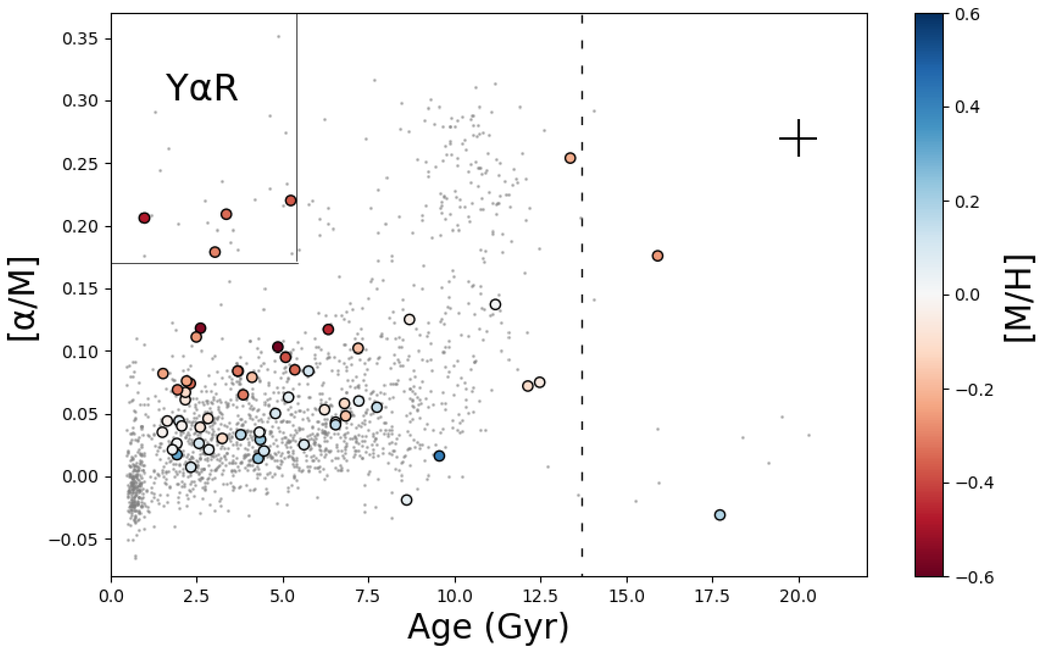
Abstract: The Continuous Viewing Zones of TESS represent regions with years of precise, space-based photometry. In these regions, we have targeted the stars on the subgiant branch and lower giant branch, regions that were understudied by the Kepler Mission. We show that the TESS data is sufficient to measure asteroseismic parameters for more than 80 stars. We also show how these stars can be used to study TESS detection systematics, the quality of stellar evolution models in this regime, the evolution of the galaxy with age, and the physics of internal angular momentum transport.

Sophia Grusnis et al., TASC Review

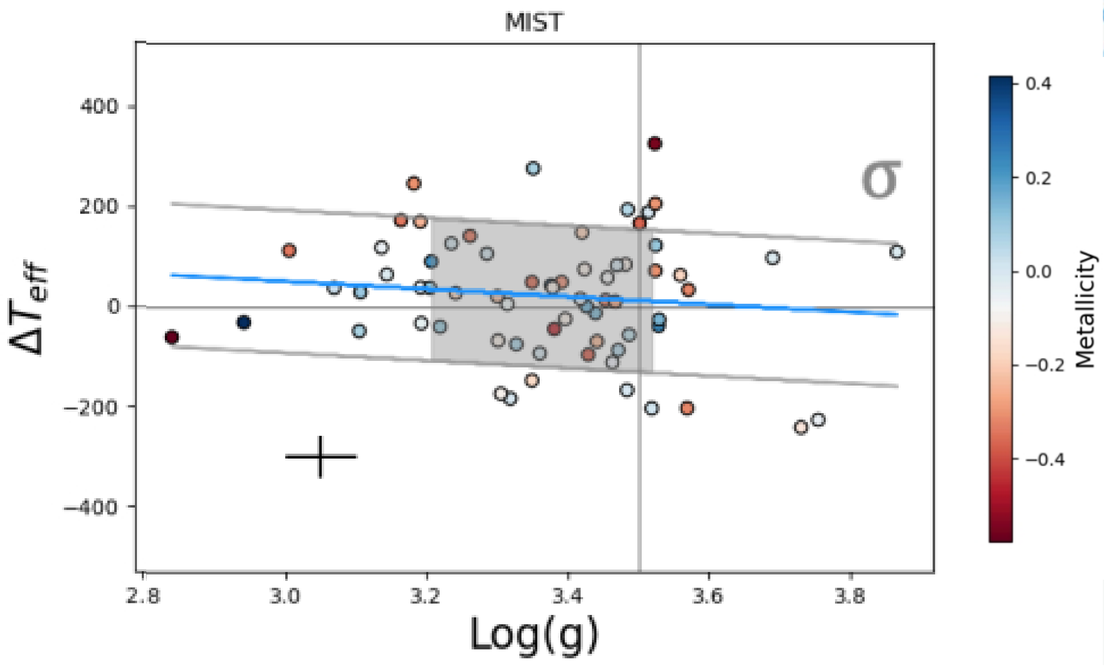




We have fewer seismic detections than expected, especially for fainter, bluer subgiants



We get age distributions consistent with previous work, and identify stars with potentially interesting (binary?) evolution histories including the ‘young’ alpha-rich stars, and stars ‘older’ than the universe



Stellar models don’t quite predict the right temperatures for these stars, but all models have similar offsets.

TESS can fill in the regime between the Kepler dwarfs and the Kepler giants

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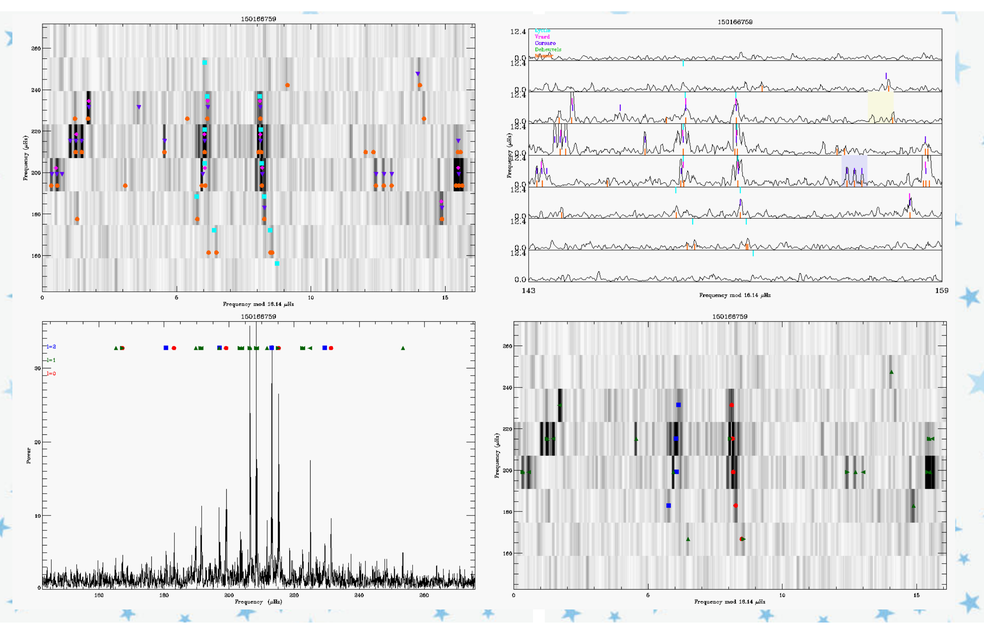
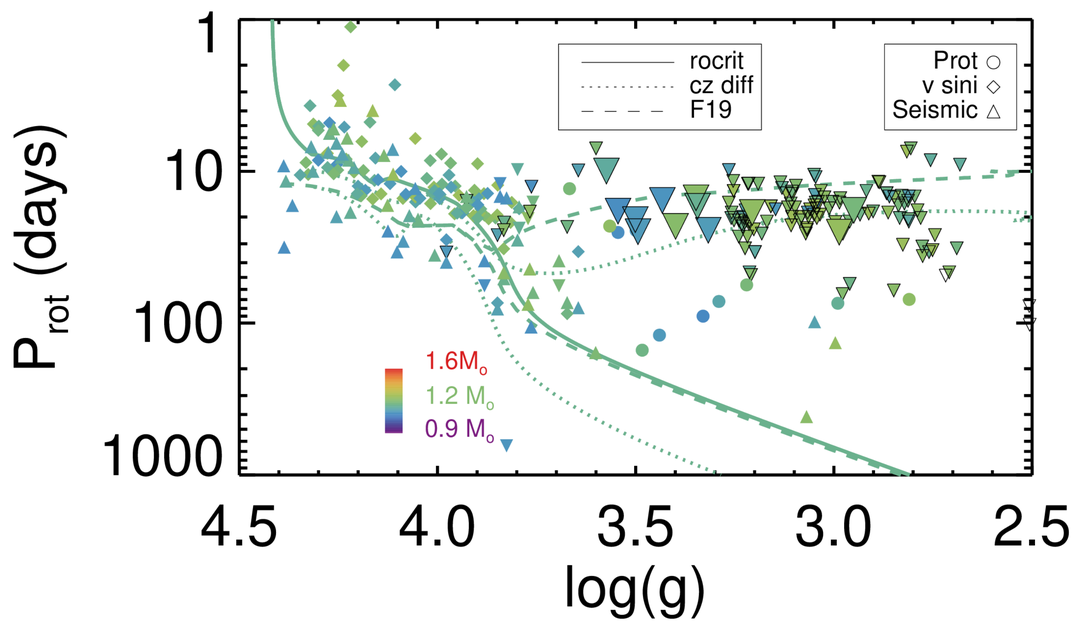


For the Southern CVZ, we have identified and peak bagged individual modes, seen rotational splittings, and estimated core rotation rates; they are in line with previous results.



Combining our data with core and surface rotation rates from the literature, we can start to compare rotational evolution to various classes of models. Recent models are much closer than before, but nothing is perfect yet.