Ensemble asteroseismology of blue-edge ZZ Cetis using THRAIN, the mighty white dwarf code

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With the success of the GAIA survey, and the advances in space-based photometry from K2 and TESS, the field of white dwarf (WD) asteroseismology has a rich pool of highly-accurate observations to draw upon. To facilitate faster and more adaptable WD models, we have developed `THRAIN`, a parametric modeling code for WD asteroseismology. `THRAIN` uses parametrized element distributions and modular equations of state. The parametrized element distributions allow skipping gigayears of stellar evolution to arrive at the WD stage. The modular equation of state uses analytic equations with exact derivatives, avoiding numerical noise caused by finite differencing or tabular interpolation. This leads to smooth profiles in all quantities, including the Brunt-Väisälä frequency. `THRAIN` models are easily adaptable, run quickly, and produce high numerical accuracy. In this talk we will describe the models and the application of `THRAIN` to understand the pulsation properties of the blue-edge ZZ Ceti white dwarfs. We will present a set of models that reproduce the $l = 1$ and $l = 2$ modes for the entire ensemble of stars, illustrating the role of canonically thick vs thin H layers and revealing the role of total mass in establishing both H and He layer thickness during the late stages of stellar evolution.