New DA white dwarf models for asteroseismology of ZZ Ceti stars

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White dwarf asteroseismology has a great potential to infer the evolutionary status and chemical stratification of these stars, and to shed light on the physical processes that lead to their formation. We present a new grid of DA white dwarf models that take into account the advances in the last decade in the modeling and input physics of both progenitor and white dwarf stars, thus avoiding several shortcomings present in previous works. These new models are derived from a self-consistent way with the changes in the internal chemical distribution that result from the mixing of all the core chemical components induced by mean molecular weight inversions, from ^{22}Ne diffusion, Coulomb sedimentation, and from residual nuclear burning. In addition, the expected nuclear burning history and mixing events along the progenitor evolution are accounted for, in particular the occurrence of third dredge-up, which determines the properties of the core and envelope of post-AGB and white dwarf stars, as well as the initial-final mass relation. The range of hydrogen (H) envelope thickness of our new ZZ models extends from the maximum residual H content predicted by the progenitor history, to $\log(M_{\rm H}/M_{\star}) \sim -13$. This opens the possibility, for the first time, of doing asteroseismological studies of ZZ Ceti stars with ultra-thin H envelopes.