Spectroscopic Characterization of Helium-Dominated Polluted White Dwarfs with Machine Learning

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For the past decades, spectral modeling of polluted white dwarfs has been a time-intensive process involving manual and iterative work. Recently, other groups have used Machine Learning (ML) to interpolate and efficiently model stellar spectra, but not yet to fit the complex and diverse spectra of polluted white dwarfs. Building upon their work, we present a novel and fast ML architecture for determining the main astrophysical properties of polluted white dwarfs based on their spectra, including their photospheric elemental abundances. In particular, we discuss our latest results for both theoretical and real observations and justify why our methodology, if successful, could open the door to statistical studies of polluted white dwarfs, thus becoming a valuable framework for the study of extrasolar geochemistry.