# Exploring the Relationship Between the Mass and the Radius of White Dwarves

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Several methods exist for modeling or calculating the various parameters defining the properties of individual white dwarfs. In addition, in recent years the Gaia mission has provided high precision distances for thousands of white dwarfs. The purpose of this project was threefold: to measure the similarity between the data produced by the White Dwarf Evolution Code (WDEC) and Montreal White Dwarf Database (MWDD), to assess the impact of various parameters on the mass-radius relationship determined from the data, and to determine the temperature of the white dwarfs based on Gaia data and the WDEC mass-radius relation. The WDEC generates models of white dwarf stars, and models it generated were plotted against data acquired by the Gaia mission (from the MWDD) to determine how closely together the methods fit. Also, by fixing various parameters (temperature, mass of the hydrogen and helium layers, envelope mass), plots of the mass-radius relationship were obtained to assess any impact to this relation. Finally, the equation obtained by modeling the mass-radius relationship was used to calculate the temperatures using the luminosity function. These temperatures were plotted against the spectroscopic temperatures obtained from the MWDD to assess discrepancies between the two independent methods. This project showed that the WDEC models are consistent with data from the Gaia mission, and that none of the parameters chosen had any significant impact on the mass-radius relation. It was also determined that the temperature data from the MWDD was consistent with data calculated from the mass-radius relation generated using WDEC.