

Machine Learning Refinements to Metallicity-Dependent Isotopic Abundances

The project aims to use machine learning algorithms to fit the free parameters of an isotopic scaling model to elemental observations. The processes considered are massive star nucleosynthesis, Type Ia SNe, the s-process, the r-process, and p-isotope production. The analysis on the successful fits seeks to minimize the reduced chi squared between the model and the data. Based upon the successful refinement of the isotopic parameterized scaling model, a table providing the 287 stable isotopic abundances as a function of metallicity, separated into astrophysical processes, is useful for identifying the chemical history of them. The table provides a complete averaged chemical history for the Galaxy, subject to the underlying model constraints.

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