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Nonparametric consistency test between observations and astrophysical models

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The common practice of model validation in statistical methods is not as widespread in astronomy. Too often, models are assumed to describe observations even when there is no agreement between the two. To improve this, we propose a practical framework for assessing the consistency between observations and astrophysical models in a model-independent manner. The consistency test uses a combination of nonparametric methods and distance measures to obtain a test statistic that evaluates the closeness of the astrophysical model to the observations; hypothesis testing is then performed using a bootstrap sample. The ultimate goal of this project is to build an easy-to-use consistency test for multiple scenarios such as density models and regression models.

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