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SNCOSMO

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ABSTRACT

We present SNCosmo, an open-source Python library for common analysis tasks in supernova cosmology. The library is intended to be used by the researcher performing a sequence of tasks in an analysis pipeline combining user-defined-functions with calls to the SNCosmo library, as well as by the user who wishes to perform quick calculations. Currently, the library features a flexible API for supernova light curve models that provides a common interface for multiple types of models. Popular Type Ia and core-collapse models such as SALT2, Hsiao, and Nugent templates are built in and the system is designed to be extended to more complex models with varying numbers of parameters. Functionality in the library allows one to use any model to simulate supernova data from survey characteristics, or fit a model to simulated or real photometric data using a range of fitting functionality. Also included are convenience functions for input and output data formatting and plotting for easy exploration and analysis of data. The library is easy to install, publicly available and licensed under a liberal BSD-style license. The API is well-documented and the online documentation provides examples to achieve a number of tasks. SNCosmo is under continuous development by users and contributions from the community are welcome.

Subject headings: methods: data analysis — methods: statistical

1. INTRODUCTION

We haven't cited anything yet, but if we did, we might cite Guy et al. (2007) or not (Guy et al. 2005).

In this document, we provide a brief motivation, comparison with existing software. Contributions and suggestions from the user community are welcome.

2. CURRENT FEATURES

- Versatile API for new supernova light curve models, with popular models like SALT2 (and HSIAO model) implemented as examples
- Implemented models: SALT2, HSIAO
- Simulation of data from light curve models
- Faciliate exploration of supernova data
- Multiple methods of btaining SNIa model parameters from SNIa light curves
- Interaction with outputs of other software

REFERENCES

Guy, J., Astier, P., Nobili, S., Regnault, N., & Pain, R. 2005, A&A, 443, 781
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