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CosmoSIS: a system for MC parameter estimation

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CosmoSIS [<http://arxiv.org/abs/1409.3409>] is a modular system for cosmological parameter estimation, based on Markov Chain Monte Carlo (MCMC) and related techniques. It provides a series of samplers, which drive the exploration of the parameter space, and a series of modules, which calculate the likelihood of the observed data for a given physical model, determined by the location of a sample in the parameter space. While CosmoSIS ships with a set of modules that calculate quantities of interest to cosmologists, there is nothing about the framework itself, nor in the MCMC technique, that is specific to cosmology. Thus CosmoSIS could be used for parameter estimation problems in other fields, including HEP.

This presentation will describe the features of CosmoSIS and show an example of its use outside of cosmology. It will also discuss how collaborative development strategies differ between two different communities: that of HEP physicists, accustomed to working in large collaborations, and that of cosmologists, who have traditionally not worked in large groups. For example, because there is no collaboration to enforce a language choice, the framework supports programming in multiple languages. Additionally, since scientists in the cosmology community are used to working independently, a system was needed for helping ensure that proper attribution is given to authors of contributed algorithms.

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