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Spey: smooth inference for reinterpretation studies

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Analysing statistical models is at the heart of any empirical study for hypothesis testing. We present a new cross-platform Python-based package which employs different likelihood prescriptions through a plug-in system, enabling the statistical inference of hypotheses. This framework empowers users to propose, examine, and publish new likelihood prescriptions without the need for developing a new inference system. Within this package, we propose a new simplified likelihood prescription that surpasses its predecessors' approximation accuracy by incorporating asymmetric uncertainties. Furthermore, this package facilitates the integration of various likelihood combination routines, thereby broadening the scope of independent studies through a meta-analysis. By remaining agnostic to the source of the likelihood prescription and the signal hypothesis generator, our platform allows for the seamless implementation of packages with different likelihood prescriptions, fostering compatibility and interoperability.

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