

Flamedix: Fast likelihood analysis in more dimensions for xenon TPCs

Wednesday 25 November 2020 09:15 (15 minutes)

Liquid xenon time-projection chambers are the world's most sensitive detectors for a wide range of dark matter candidates. We show that the statistical analysis of their data can be improved by replacing detector response Monte Carlo simulations with an equivalent deterministic calculation. This allows the use of high-dimensional undiscretized models, yielding up to ~2times better discrimination of the dominant backgrounds. In turn, this could significantly extend the physics reach of upcoming experiments such as XENONnT and LZ, and bring forward a potential 5sigma dark matter discovery by over a year.

Abstract Track

Astroparticle physics

Authors: Dr AALBERS, Jelle (Stockholm University); Mr ANTOCHI, Vasile Cristian (Stockholm University); CONRAD, Jan; PELSSERS, Bart (Stockholm University); TAN, Pueh-Leng (Stockholm University)

Presenter: TAN, Pueh-Leng (Stockholm University)

Session Classification: Wednesday morning