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Deficit hawks: robust new physics searches with unknown backgrounds

Thursday 21 July 2022 15:00 (20 minutes)

Astroparticle physics experiments often face unknown backgrounds, e.g. at low energies or near detector edges. This talk introduces the deficit hawk technique, which mitigates unknown backgrounds by testing multiple options for data cuts simultaneously. This can double the physics reach of experiments with partial or speculative background knowledge, and simplifies decisions on fiducial volumes or energy thresholds. Deficit hawks are well-suited to analyses that use machine learning or multidimensional likelihoods, and permit discoveries in regions without unknown backgrounds.

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