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Discovering matter-antimatter asymmetries with GPUs

The LHCb experiment has recorded the world's largest sample of charmed meson decays. The search for matter-antimatter asymmetries in charm sector requires high precision analysis and thus intensive computing. This contribution will present a powerful method to measure matter-antimatter asymmetries in multi-body decays where GPU systems have been successfully exploited. In this method, local asymmetries in phase-space distributions were explored with an unbinned approach, and the parallelisation of GPU makes this approach feasible for the first time. The performance including on GPUs on the grid will be discussed in detail. With this new method, the world's best sensitivities to particular decay channels have been achieved.

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