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New concept of general-purpose spectrometer with proton polarimeter function

we propose a novel approach to measure the final-state proton polarization in large-acceptance collider experiments. Using existing tracking devices and supporting structure material, general-purpose spectrometers can be utilized as a large-acceptance polarimeter without hardware upgrade. This approach is tested at BESIII, and can be applied at nearly all major facilities, such as Belle-II, CMS, ATLAS, LHCb, CBM, EIC etc., enabling general-purpose spectrometer to extract final-state proton polarization in addition to the traditional four-momentum measurements. This capability would vastly expand the physics reach of these experiments, and has potential for substantial impact across nuclear and particle physics.

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Track Classification: Application of spin and nuclear polarization techniques