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Top quark charge asymmetry at LHCb

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The LHCb experiment provides unique detector coverage, $2 < \eta < 5$, of high energy proton-proton interactions produced at the Large Hadron Collider. Designed to study b- & c-hadron physics, LHCb is fully instrumented in the forward region with excellent tracking and vertex resolution.

The top quark is the heaviest fundamental particle and is expected to play a special role in new physics scenarios. Higher order interference mechanisms, sensitive to physics beyond the reach of current colliders, result in a charge asymmetry, A_{t} , in the angular distributions of top pairs. LHCb's acceptance offers greater sensitivity to A_{t} due to reduced dilution from gluon-gluon fusion.

Top quarks are identified through the presence of a high p_{T} muon and b-jet in the final state. Forward production was first observed with Run I data at LHCb in this channel. The increase in available statistics with Run II, as well as improved signal to background ratio, will allow the first measurement of the top charge asymmetry in the forward region.

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