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Evidence for an anomalous like-sign dimuon charge asymmetry

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We measure the charge asymmetry A of like-sign dimuon events in 6.1 fb^{-1} of p anti- p collisions recorded with the D0 detector at a center-of-mass energy $\sqrt{s} = 1.96 \text{ TeV}$ at the Fermilab Tevatron collider. From A , we extract the like-sign dimuon charge asymmetry in semileptonic b -hadron decays:

$$A^b_{\text{sl}} = -0.00957 \pm 0.00251(\text{stat}) \pm 0.00146(\text{syst}).$$

This result differs by 3.2 standard deviations from the standard model prediction

$A^b_{\text{sl}}(\text{SM}) = (-2.3^{+0.5}_{-0.6}) \times 10^{-4}$ and provides first evidence of anomalous CP-violation in the mixing of neutral B mesons.

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