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W-boson angular coefficients at LHC at high precision

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The spin structure of the weak gauge bosons produced at non-zero transverse momentum at proton-proton colliders leads to a parametrization of the cross section of the Drell-Yan process by a set of eight angular coefficients. These coefficients have been measured for the Z-boson by various experiments. The W-boson mass measurement at the LHC relies in part on precise knowledge of the W-boson angular coefficients, which currently is based on extrapolation from and theory comparison to the Z-boson coefficient measurements. We present predictions for the dominant W-boson coefficients for the first time at fixed-order NNLO QCD+NLO EW, differentially in the vector boson transverse momentum and rapidity. The mixed NNLO QCD and electroweak predictions presented for the W-boson coefficients provide at present the most precise predictions available for these observables for finite-pT W-boson production, and enables on the one hand a more accurate measurement of the W-boson mass, as well as a guideline for future measurements of these angular observables.

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