

# Realistic extraction of polarisation and spin-correlation coefficients in di-boson processes at the LHC

*Saturday 20 July 2024 12:15 (15 minutes)*

As shown by recent theoretical and experimental developments, the Standard Model of fundamental interactions can be tested at collider with the lens of quantum information theory. To achieve this aim it is essential to establish a relation between the kinematical distribution of stable, detectable particles and the spin-density matrix.

In the realistic simulation it is unavoidable to impose acceptance cuts on the kinematics of final-state particles, leading to a partial loss of information necessary to reconstruct the spin-density matrix of underlying resonances.

In this work we study the impact of acceptance cuts and higher-order corrections on the extraction of polarisation and spin-correlation coefficients in di-boson production at the LHC with leptonic decays. We investigate a purely geometrical factor which can accurately compensate for acceptance effects. The application of this factor allows to obtain a clean interpretation of diboson LHC events directly starting from the data.

## Alternate track

1. Computing, AI and Data Handling

## I read the instructions above

Yes

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