

Contribution ID: 193

Type: not specified

Scalar leptoquarks at the LHC and flavour anomalies: a comparison of pair-production modes at NLO-QCD

Leptoquarks are particles that simultaneously carry lepton and baryon number, and appear in many extensions of the Standard Model (SM). The appearance of so-called flavour anomalies has led to increased interest in leptoquark models which are known to mitigate the tensions between theoretical expectations and experimental measurements.

I will present a next-to-leading order (NLO) calculation in QCD of scalar leptoquark pair production at the LHC with predictions including *t*-channel lepton exchange contributions. In particular, NLO-QCD predictions are calculated for off-diagonal production channels, *i.e.* channels that involve two different leptoquark eigenstates and are driven solely by diagrams involving SM leptons in the *t*-channel at leading order, as opposed to diagonal channels where a pair of the same leptoquark eigenstate is produced. It is found that reliable theoretical predictions for both channels require NLO accuracy. Furthermore, the relative importance of the off-diagonal modes depends strongly on the considered scenario, ranging from effects of an order of magnitude in generic models to a negligible impact in phenomenologically viable scenarios addressing the flavour anomalies.

Summary

Primary authors: Dr JUEID, Adil; Prof. KULESZA, Anna; Prof. FUKS, Benjamin; Dr BORSCHENSKY, Christoph (Karlsruhe Institute of Technology)

Presenter: Dr BORSCHENSKY, Christoph (Karlsruhe Institute of Technology)

Session Classification: Parallel Session Wednesday

Track Classification: Particle Phenomenology