OLOMOUC, CZECH REPUBLIC
9th International Workshop on Top Quark Physics
19 - 23 September 2016

Contribution ID: **6** Type: **not specified**

Multilepton signatures from tZq interactions in the SM and top-FCNC

Tuesday, 20 September 2016 17:50 (10 minutes)

The associated production of a single top quark and a Z boson (tZq) is a rare process predicted by the standard model (SM). Being sensitive to the top-Z and the trilinear gauge couplings, it constitutes an important probe of the SM. While tZq has a moderate cross section, its yield can be enhanced by flavor changing neutral current (FCNC) interactions. The observation of top-FCNCs, which are highly suppressed in the SM, would be a clear sign of new physics. Moreover, by setting limits in a model-independent way on the abundance of these processes, one can exclude many new physics models. In this talk, we discuss multilepton signatures coming from a tZq interaction, either in the context of the SM or arising from an FCNC interaction. Both analyses are battling the same backgrounds and have therefore a similar analysis structure. Using multivariate discriminants in multilepton final states on either 8 TeV or the 13 TeV datasets, an observation or exclusion limit is set.

Summary

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Session Classification: Young Scientists Forum

Track Classification: Young Scientist Forum