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## Rare top quark production in CMS: $t\bar{t}Z$ , $t\bar{t}W$ , $t\bar{t}\gamma$ , $tZ$ , $t\gamma$ , and $t\bar{t}t\bar{t}$ production

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### Summary

A comprehensive set of measurements of top quark pair and single top quark production in association with EWK bosons ( $W$ ,  $Z$  or  $\gamma$ ) is presented. The results are compared to theory predictions and re-interpreted as searches for new physics inducing deviations from the standard model predictions using an effective field theory approach. The status of the search for four top quark production, to which the LHC experiments are starting to be sensitive, and that has important BSM re-interpretations, is also reported.

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