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## Using Top-Quark as a probe for new physics with the use of MatrixElements Generators

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The top-quark is the heaviest quark of the SM with a Yukawa coupling close to unity. Most of the new physics models which extend the SM predict a heavy particle spectrum which is accessible with the proton collisions at the LHC. It is therefore expected that the top-quark plays a dominant role in the search for effects of these new models. We will concentrate on the particular kinematic topologies reflecting the process  $pp \rightarrow t\bar{t} \rightarrow bWbW$  where several new physics models predict deviations from the SM differential distributions. Examples could be models which include supersymmetry with some explicit or spontaneous breaking mechanism, Technicolor, extra dimensions, etc. The so-called semi-leptonic decay of the top-quark (one W decays into a quark pair, one W decays into a lepton-neutrino pair) will be the key topology defined by 4 jets, 1 lepton and missing transverse energy from the neutrino in the final state. Thus, a very crucial step, in order to be able to build models that can differentiate NewPhysics from SM is to use Monte Carlo techniques, in order to have an estimation of what we expect to see after collecting and analyzing the real data at LHC. This step, includes the production of millions of events using MadGraph which can produce the Feynmann diagrams and then, the simulation, i.e. how a event of interest would look like if was to be seen from our real detectors.

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