

ATLAS preparations for precise B-decays measurements sensitive to BSM phenomena

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The LHC experiments will perform sensitive tests of physics phenomena beyond the Standard Model (BSM). Investigation of decays of beauty hadrons represents an alternative approach in addition to direct BSM searches. The ATLAS efforts concentrate on those B decays that can be selected already at the first and second trigger levels.

The most favorable trigger signature will be for B hadrons decaying to $J/\psi \rightarrow \mu\mu$. Using this trigger ATLAS will be able to accommodate unprecedentedly high statistics in so called Golden LHC channel: $B_s \rightarrow J/\psi \phi$ allowing a measurement of the CP violation effect, where BSM models predicted values are significantly higher than SM.

In the rare decays sector, these are purely di-muon decays, and families of semi-muonic exclusive channels. Already with 1 fb^{-1} the ATLAS sensitivity in the di-muon channels will be comparable to today worlds statistics. The strategy is to carry on the di-muon channel programme up to nominal LHC luminosity. In particular in each of these two experiments the $B_s \rightarrow \mu\mu$ signal with 4.3 sigma significance can be measured combining low luminosity samples with those of one year of LHC operation at a luminosity of $10^{34} \text{ cm}^{-2} \text{ s}^{-1}$. This precision allows excluding or confirming the SM unambiguously.

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