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## Top quark mass measurement with soft muons from b-hadron decay

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The top quark is the heaviest particle known in the Standard Model (SM) of particle physics. Due to its large mass, the top quark decays before hadronising. This fact gives the unique possibility to study the phenomenology of a bare quark. In particular, a precision measurement of the top quark mass is crucial to test the SM structure and to constrain any eventual dynamics beyond the SM. The top quark mass has been measured with several methods. In this poster a new approach to its measurement is presented. The method relies on the Soft Muon Tagging (SMT), which is the capability to identify a muon in the semileptonic decays of hadrons originating from the hadronisation of the b(anti-b) quark coming from the top (anti-top) decay ( $t \rightarrow Wb$ ). By reconstructing the invariant mass of the soft muon and the prompt lepton coming from the leptonic W decay, it is possible to extract the top quark mass. The performance of this method are presented in this poster based on data collected at a center of mass energy of 13 TeV in data 2015 and 2016, by the ATLAS experiment at the LHC.

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