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Probing colour reconnection using boosted hadronically decaying top quarks

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One of the largest uncertainty in many top quark measurements is the one on the modelling of colour reconnection (CR) between top quark decay products. There have been several experimental measurements, notably of the pull angle in $t\bar{t}$ events, which were intended to provide useful input to CR modelling, but we have not seen strong sensitivity. In this presentation, we propose a novel way to construct observables sensitive to CR using a large-radius jet containing all decay products of a boosted hadronically decaying top quark. We construct geometrical areas between the subjets, and measure charged particle activity in those areas. At particle level, we see difference in activity when the areas are constructed between colour-connected subjets, and otherwise.

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