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Factorization of Inclusive Semileptonic Off-Shell and Boosted Top Quark Decays in the Endpoint Region

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Due to its large mass the top quark plays an important role in consistency checks of the Standard Model and new-physics searches. Studies concerning precise theoretical predictions of the top production and its decay are commonly based on the narrow-width (NW) limit of the top quark propagator or on full off-shell computations. Starting with a short introduction to effective field theories, I will present our recent progress concerning a novel approach that allows to combine the factorization property of the NW limit and off-shell effects. Our approach is based on QCD factorization theorems for boosted top quarks in the resonance region and applies effective field theoretical methods known from SCET to the electroweak theory. The approach allows to incorporate resummed QCD corrections for differential top decay observables using boosted HQET generalizing results known from semileptonic B decays in the endpoint region.

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