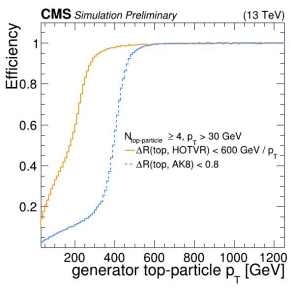
Mass aware jet clustering with Variable-R and a soft drop veto

Why do we need Variable-R jet clustering?

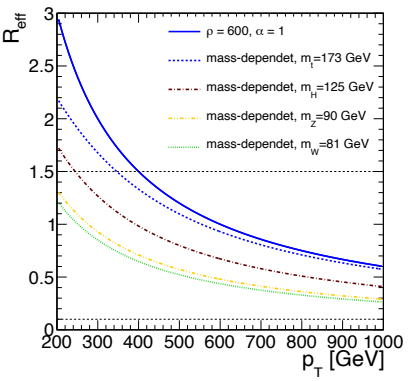
- Especially in multiscale problems like 4 top final states, Variable-R can offer an increased efficiency
- So far HOTVR (heavy object tagger with variable R) was optimised for top tagging and using mass jump
- Included mass aware jet clustering and soft drop to HOTVR!



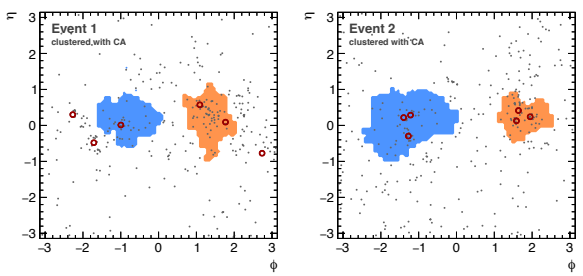
[CMS-DP-2024-038]

Mass aware jet clustering with Variable-R

For a top mass, the mass-dependent radius is similar at high p_T but smaller at low p_T

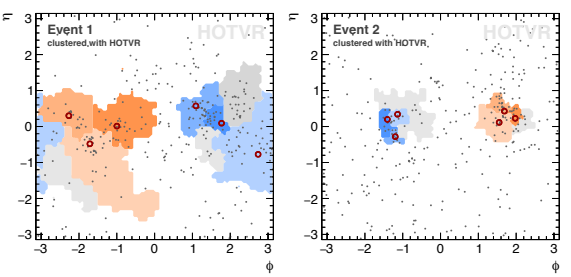


Fixed R



VS

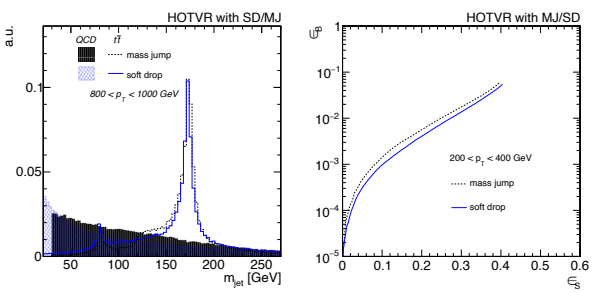
Variable R (HOTVR)



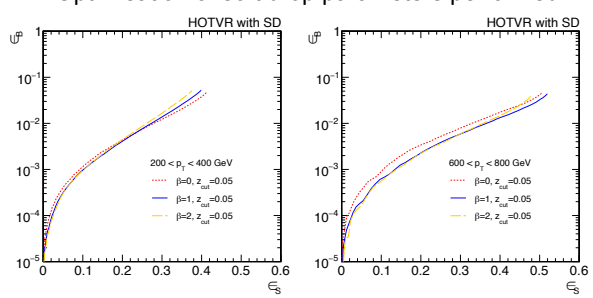
[arxiv:1606.04961]

Grooming: mass jump vs soft drop

Soft drop grooming improves the performance due to shifting the background

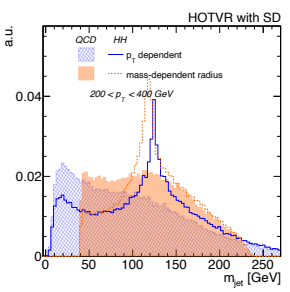


Optimisation of soft drop parameters performed

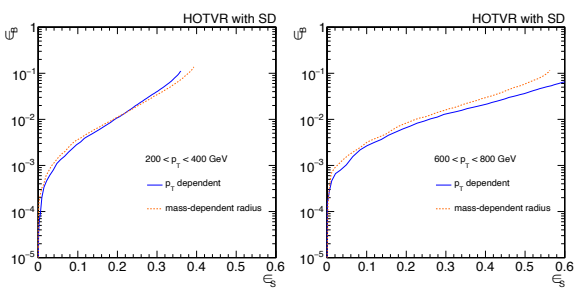


Optimisation for Higgs tagging

Difference in mass tail observed



Performance based on τ_{21} and seems similar



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DESY.

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