



Contribution ID: 148

Type: Parallel Talk

## Spectral clustering for jet physics

*Friday, 8 July 2022 14:30 (15 minutes)*

We present a new approach to jet definition alternative to clustering methods, such as the anti-kT scheme, that exploit kinematic data directly. Instead the new method uses kinematic information to represent the particles in a multidimensional space, as in spectral clustering. After confirming its Infra-Red (IR) safety, we compare its performance in analysing  $gg \rightarrow H_{125\text{GeV}} \rightarrow H_{40\text{GeV}} H_{40\text{GeV}} \rightarrow \bar{b}b\bar{b}b$ ,  $gg \rightarrow H_{500\text{GeV}} \rightarrow H_{125\text{GeV}} H_{125\text{GeV}} \rightarrow \bar{b}b\bar{b}b$  and  $gg, q\bar{q} \rightarrow t\bar{t} \rightarrow \bar{b}b W^+ W^- \rightarrow \bar{b}b j j l_i$  events from Monte Carlo (MC) samples, specifically, in reconstructing the relevant final states, to that of the anti-kT algorithm. Finally, we show that the results for spectral clustering are obtained without any change in the parameter settings of the algorithm, unlike the anti-kT case, which requires the cone size to be adjusted to the physics process under study.

### In-person participation

Yes

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**Session Classification:** Strong interactions and Hadron Physics

**Track Classification:** Strong interactions and Hadron Physics