Contribution ID: **21** Type: **ORAL**

Decoding Higgs Boson Branching Ratios from Event Shape Variables

In this talk I will introduce a novel strategy [1] for the simultaneous measurement of Higgs-boson branching ratios into gluons and light quarks at a future lepton collider operating in the Higgs-factory mode. The method is based on template fits to global event-shape observables, and in particular fractional energy correlations, thereby exploiting differences in the QCD radiation patterns of quarks and gluons. This is orthogonal to measurements based on traditional tagging methods based mainly on displaced vertices and allows for an extraction of limits on both Higgs boson to gluon- and light quark branching ratios separately.

[1] Max Knobbe, Frank Krauss, Daniel Reichelt, Steffen Schumann 2023, arXiv:2306.03682

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Session Classification: Parallel - WG1-HTE

Track Classification: WG1-HTE - Physics Potential: Higgs, top, and electroweak