Weekly Report

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Objectives

1. Calculate Event Shape variables in e^+e^- annihilation process.

2. Identify jet axis to extract quark and gluon properties to train algorithm.

3. Compare with results obtained using FastJet (Luis).

# Event Shape Analysis (ESA): Structure variables

Jet mass distribution

Jet mass:

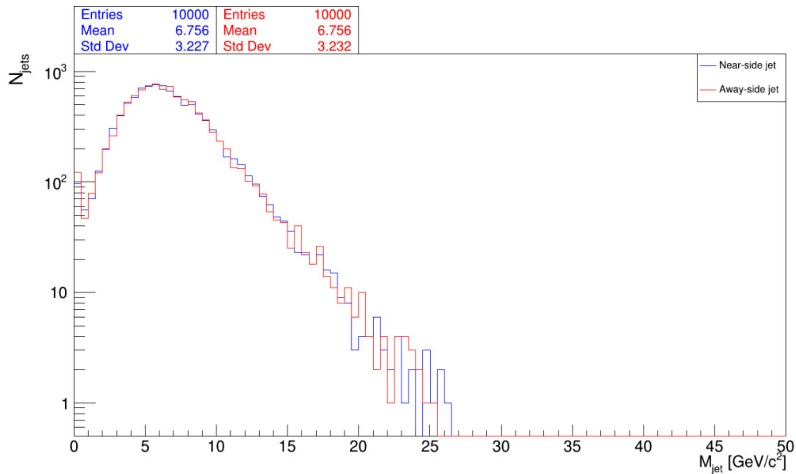$$M_{\text{jet}} = \sqrt{E^2 - p_{\text{T}}{}^2 - p_{\text{z}}{}^2}$$

Using the jet 4-momentum components calculated previously and the **corrected** radius parameter R to differentiate between near-side jet and away-side jet particles, we can calculate jet mass M for both near side and away side jets.

Event Shape Analysis (ESA):
Multiplicity, $\Delta\phi$, p_T, and E distributions
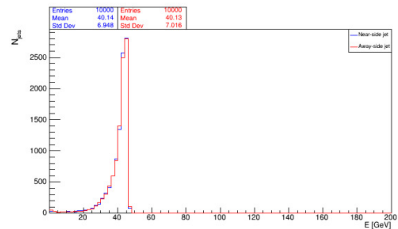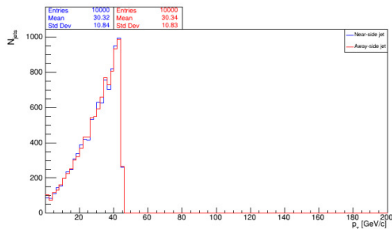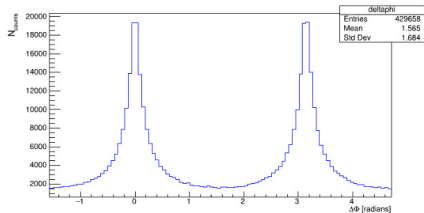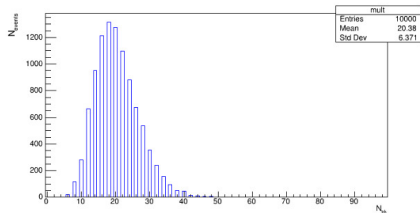
Event Shape Analysis (ESA): Jet mass distribution

Next step

1. Learn how to use the calculated properties for quark jets and store the data as a tree.

2. Train ML algorithm