The jet mass is a crucial discriminating variable in studies involving jet substructure. The calorimeter mass has been the canonical mass definition during the first run of ATLAS. This poster describes how the calorimeter mass can be combined with the track-assisted jet mass (which is obtained by associating inner detector tracks with calorimeter jets), to yield a new jet mass definition, the combined jet mass.

**Development of the Combined Jet Mass**

The calorimeter and TA weights are calculated from fractional resolution maps, where the fractional resolution is plotted in bins of the calorimeter jet transverse momentum, $p_T$. The combined jet mass is obtained by combining the jet transverse momentum, $p_T$, and a correction $\delta m$ which measures the Lorentz boost of a jet, for the calorimeter (TA) resolution. The jets have pseudo-rapidity in the range $-2.0$ to $+2.0$.

It is possible to also derive combined mass weights with a correlation correction, where the correlation correction comes from the correlation between the calorimeter and track-assisted mass responses. With correlations it should be possible to further improve the combined jet mass performance. This work is still preliminary and non-negligible correlations do not form part of the current Moriond recommendations. The combined mass recommendations for Moriond, 2017 [5], can be summarised:

- Combined mass weights derived from the calorimeter and track-assisted mass resolution maps, using jets from Pythia 8 QCD dijets.
- Correlations between mass responses are neglected.
- Correlation-corrected weights are available, but not recommended.

**References**