# Technical Note is in progress…

**Reported results are from two Pythia samples:**
- **MB**
- **Hard pt**

**In both cases we have included the information at levels:**
- **Generator**
- **Reconstruction (TPC-only)**

**We have reported a comparison between pythia and phojet generators in the context of the event shape analysis.**

## Event Shape Analysis in ALICE

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### Contents



**Abstract**

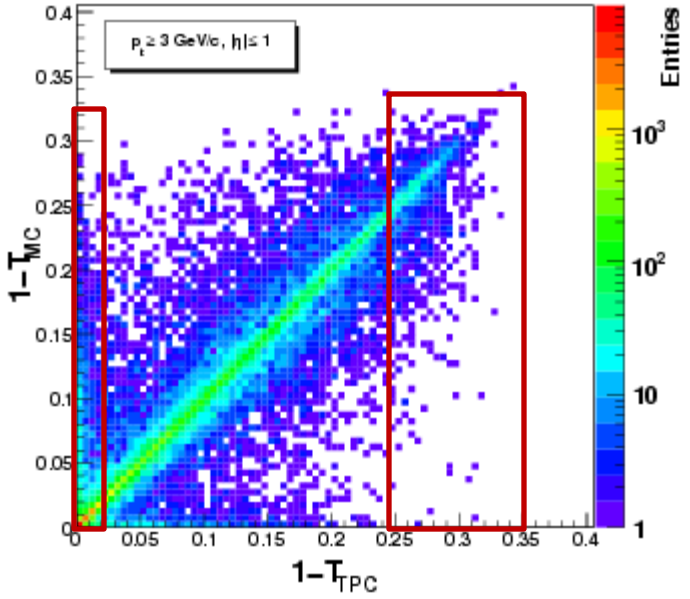
The jets are the final manifestation of the hard parton scattering, since at LHC energies the production of hard processes in proton-proton collisions will be copious, it is important to develop methods which will permit us to identify them through the study of their final states. In the present work we describe a method based on the use of some shape variables to discriminate events according their topologies. A very attractive feature of this analysis is the possibility of using the tracking information of the TPC alone in order to identify specific events like jets. Through the correlation between the quantities: thrust and recoil, calculated in two classes of samples (hard $p_t$ and $MB$; proton-proton collisions) at LHC energies, we show the sensibility of the method to select high multiplicity and high $p_t$ events. The presented results were obtained both at level generator and after reconstruction.

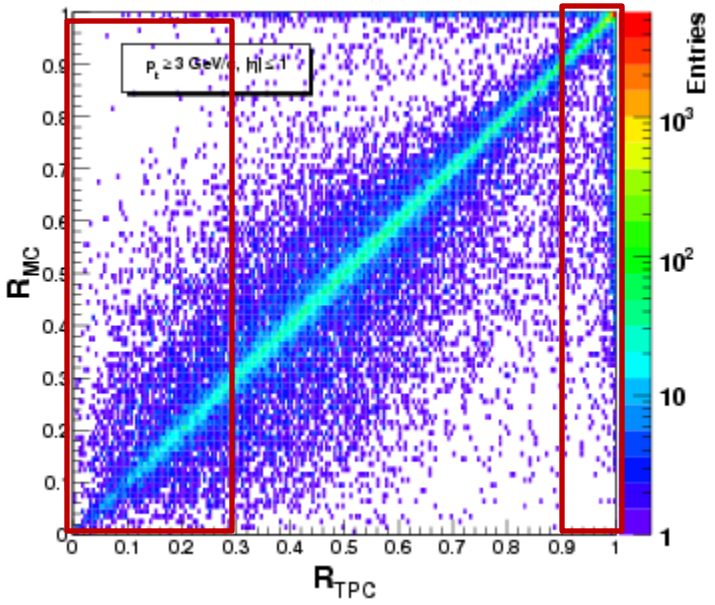
# Computing: T and R…

## (sample: Pythia, pp at 14 TEV in the c.m., 15<hardpt<50, 300K events)

1. **Monte Carlo level:**
   - Primary charged particles[2] in the acceptance: $|\eta| \leq 1$
   - At least three primary charged particles with $p_t \geq ptcutoff$.

2. **Reconstruction level:** In the present analysis we used tracks reconstructed by the TPC [3] of ALICE.
   - Tracks associated to primary charged particles in the acceptance: $|\eta| \leq 1$. To select this class of tracks we applied the following cuts.
     (a) Events with reconstructed vertex and with its position in $z$ axis: $|v_z| \leq 10$ cm.
     (b) TPC refit.
     (c) At least 50 clusters in TPC.
     (d) Covariance matrix cuts.
     (e) Reject kink daughters.
     (f) Maximum DCA (in $xy$ and $z$) to vertex 3 cm.
   - At least three tracks from primaries with $p_t \geq ptcutoff$

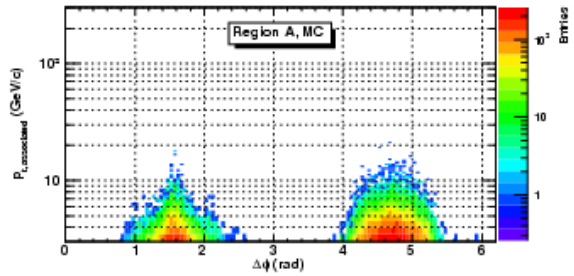


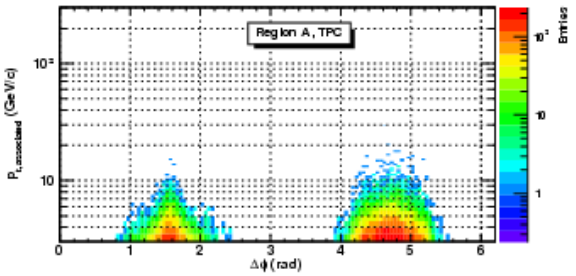



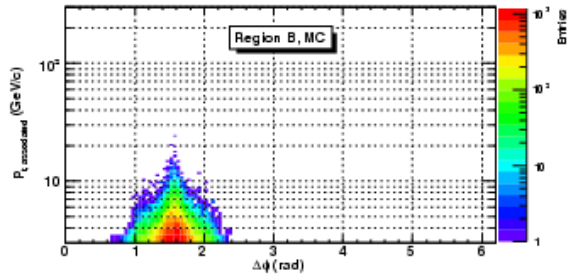
| Region | Kind of event | Variables |
|---|---|---|
| A | Dijets | $R \leq 0.35$, $\tau \leq 0.03$ |
| B | Monojets | $R \geq 0.9$, $\tau \leq 0.03$ |
| C | Mercedes | $R \leq 0.4$, $\tau \geq 0.25$ |

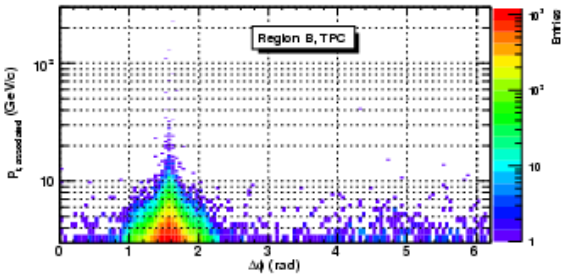
## Generation

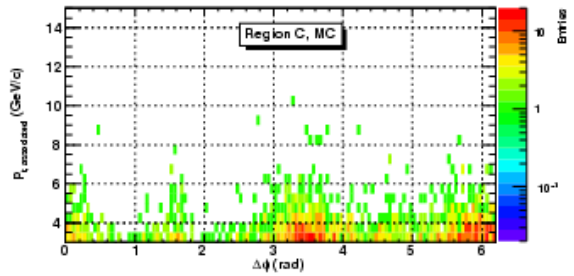
## Reconstruction

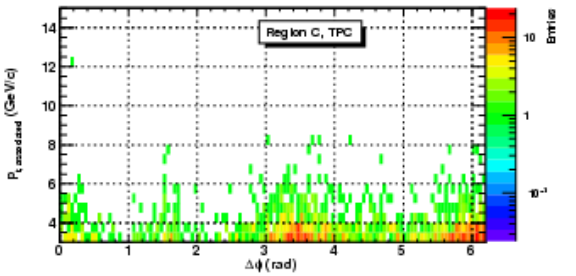


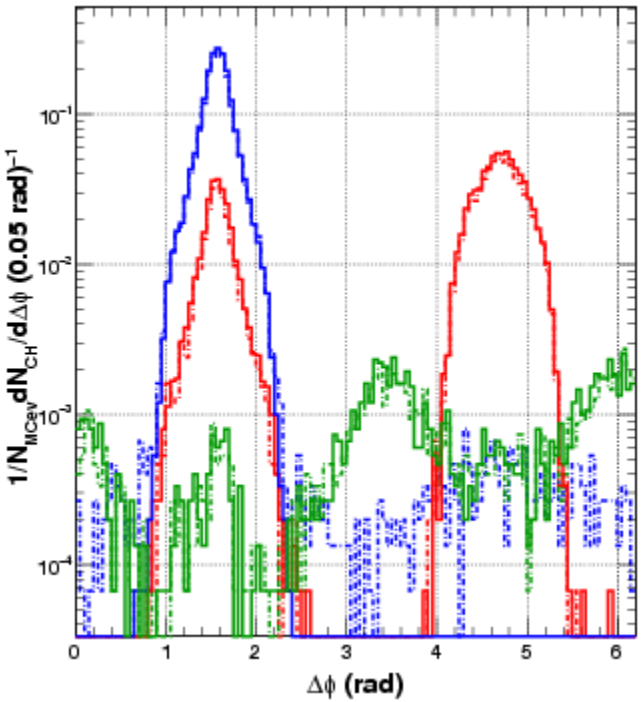



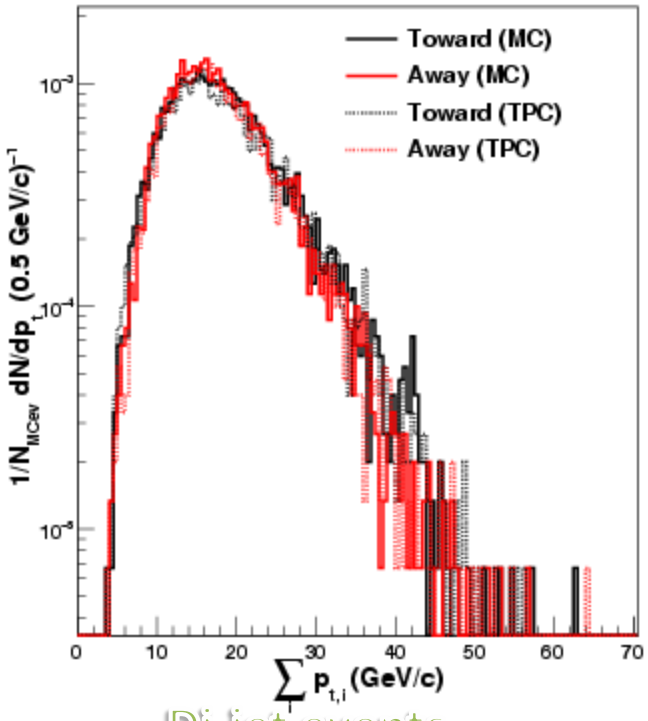



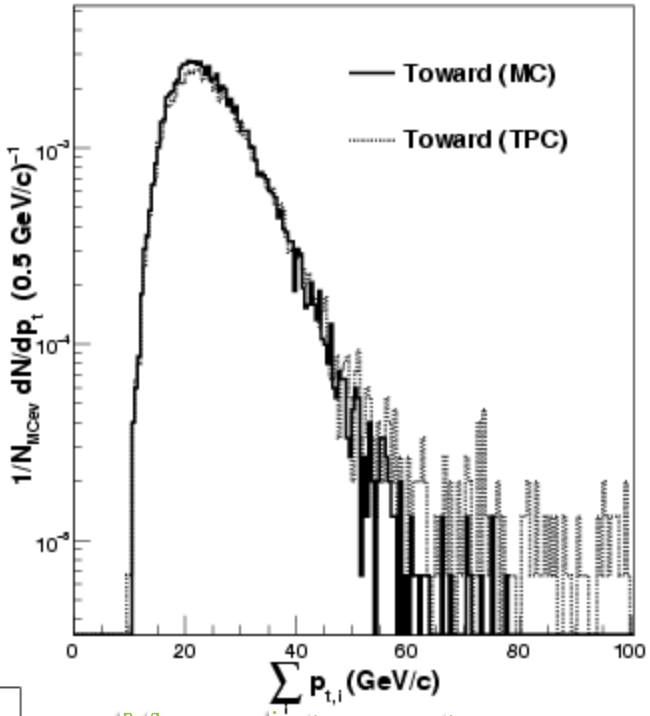

Mono-jet events have wrong measured high momentum. Possibly is an consequence of the jet location in eta.

| Event | MC | TPC | $1-T$ ($\tau$) cuts | $R$ cuts |
|---|---|---|---|---|
| All | 300000 | 300000 | no | no |
| With $T$ | 51480 | 47450 | no | no |
| Dijet | 5074 | 4649 | $\tau \leq 0.03$ | $R \leq 0.35$ |
| Monojet | 12530 | 12090 | $\tau \leq 0.03$ | $R \geq 0.9$ |
| Mercedes | 371 | 365 | $\tau \geq 0.25$ | $R \leq 0.4$ |

**Acceptable identification of di-jet, mono-jet and mercedes events using TPC-only!!!**

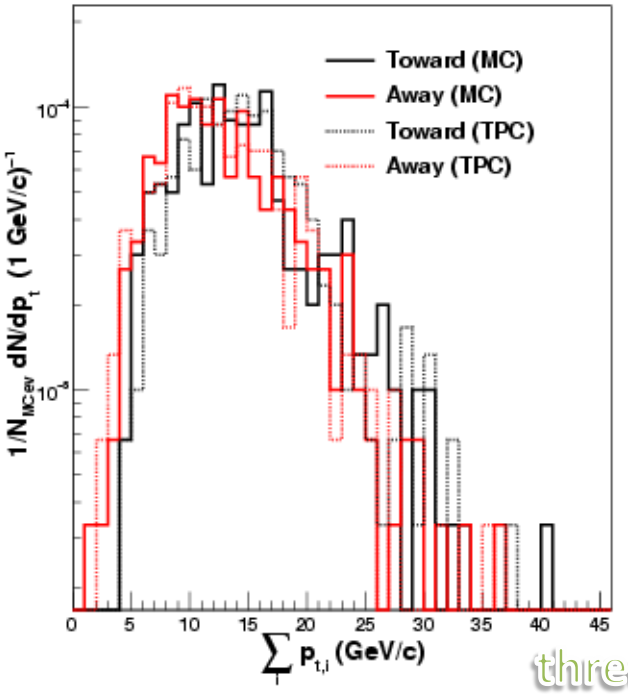



Di-jet events




Mono-jet events

**Transverse momentum conservation**




three-jet events

**High multiplicity events and the shape variables…**