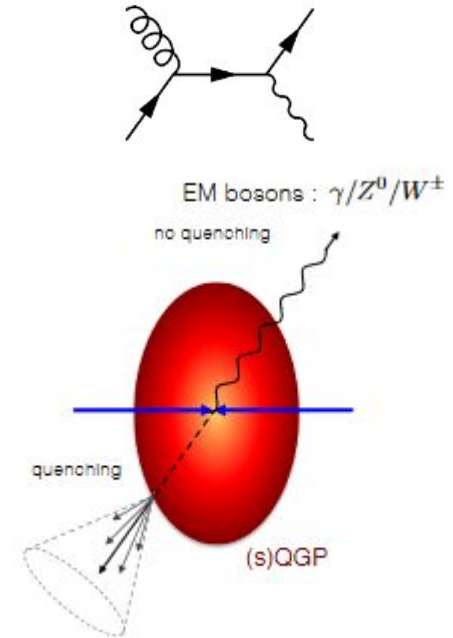


V2 parameter bias in ALICE data measurement

Gérémy Tancogne

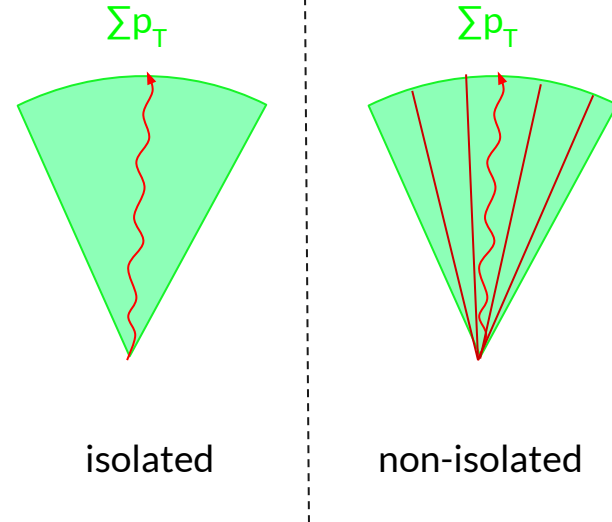
Correlations

- Measure the correlations between two particles coming from the hard processes
 - Best case : correlation between a photon and a hadron
 - Otherwise, correlation between two hadrons
- Detected by EMCal as isolated photons or paired photons (hadrons)



Particles identification

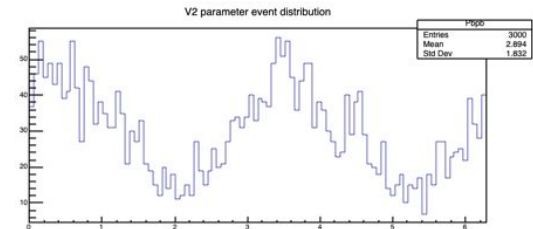
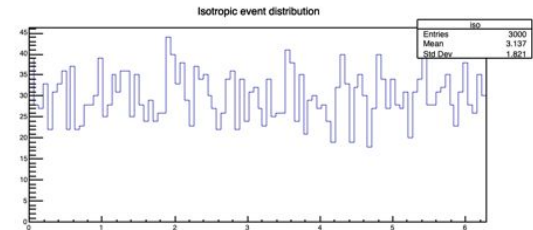
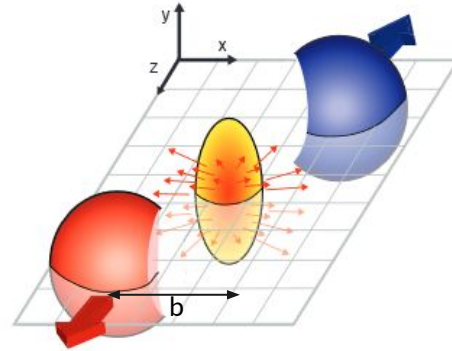
- Particles necessary for this analysis
 - Direct photons (near side)
 - Hadrons (away side)
- Particles we want to eliminate
 - Decay photons
 - Fragmentation photons
- Measure the number and energy of particles in a cone around the trigger event



Underlying event

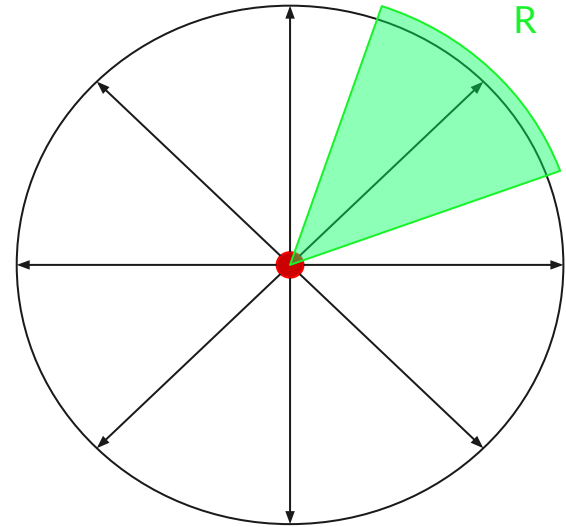
- Collisions generates underlying event
 - isotropic distribution (p-p, p-N, central N-N)
 - sinusoidal distribution (N-N with $b \neq 0$)
- Adds background in the cone, making the identification of the trigger particles harder
- Measure the background of the UE to subtract it from our data

$$E \frac{d^3 N}{d^3 p} = \frac{d^2 N}{2\pi p_T dp_T dy} \left(1 + \sum_{n=1}^{\infty} 2v_n \cos[n(\Phi - \Psi_R)] \right)$$



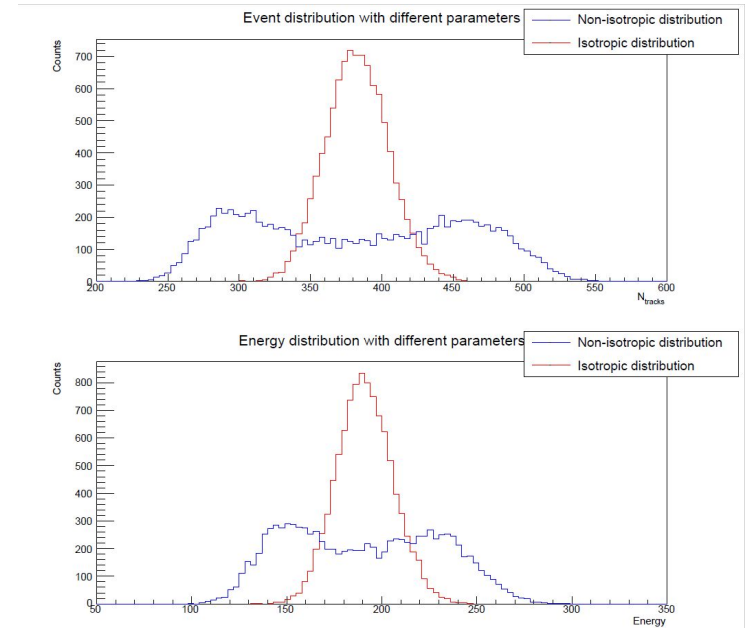
Toy Model

- Simulate the underlying event
- Generates a random number of tracks with a sinusoidal distribution and give them a random energy following a exponential distribution (e^{-2x})
- Measure the number of events and the total energy in the cone of size R
- Simplistic 2D, ideal model



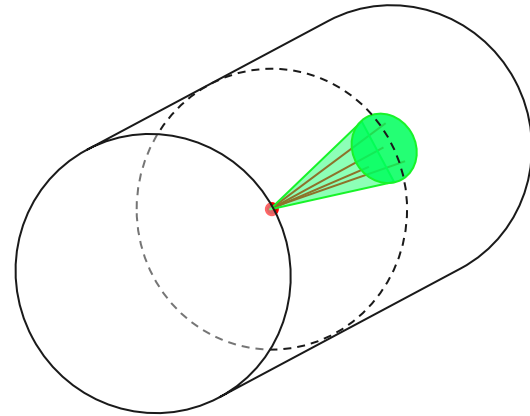
Results

- The program gives us the distribution in energy and number of event due to the underlying event.



Perspectives

- The program still have to be perfected, by example by adding a second dimension of pseudo-rapidity
- Take the acceptance of the TPC and EMCal into account
- Separate the neutral particles from the charged particles





Sources

Etude du plasma de quarks et de gluons au LHC, *Julien Faivre*, 2016

Mesure des corrélations
photon-hadron auprès de l'expérience
ALICE au LHC pour l'étude du plasma
de quarks et de gluons, *Astrid Vauthier*,
2017