

# Quark Matter 2019 - the XXVIIIth International Conference on Ultra-relativistic Nucleus-Nucleus Collisions



Contribution ID: 700

Type: **Poster Presentation**

## Study of the charm quark production mechanisms through angular correlation of dielectrons in pp collisions with ALICE at the LHC

*Monday, 4 November 2019 17:40 (20 minutes)*

The aim of relativistic heavy-ion collisions is to investigate the properties of the Quark-Gluon Plasma (QGP) created at high-enough temperatures and/or densities. For this purpose, heavy-quarks, i.e. charm and beauty, are very useful probes for the characterization of the QGP. They are produced at the early stages of the collisions via initial hard scatterings and, therefore, they experience the full evolution of the system. However, to quantify the QGP effects it is first needed to understand the heavy-quark production in proton-proton collisions as a reference system and further in p-Pb collisions to subtract cold nuclear matter effects. In particular, the production mechanisms of heavy flavours can be studied through their angular correlations which is inherited by their decay products, such as electrons.

At leading order the heavy-flavour pair is created back to back through flavour creation. On the other hand, PYTHIA creates pairs also via higher order processes like flavour excitation and gluon splitting with different angular correlation functions. While gluon splitting produces pairs with small angles, flavour excitation processes produce pairs without preferred angular correlation. In this poster we present the current analysis of angular distribution functions between correlated heavy-flavour electron-positron pairs in proton-proton collisions at a centre of mass energy  $\sqrt{s} = 13$  TeV measured with the ALICE detector and the comparison with simulated mechanisms processes obtained by PYTHIA and POWHEG generators. Angular correlation functions will also be compared to HVQMNR NLO calculations, which show that they are sensitive to  $k_T$  broadening.

**Primary author:** FRANZ DEGENHARDT, Hermann (Universidade de Sao Paulo (BR))

**Presenter:** FRANZ DEGENHARDT, Hermann (Universidade de Sao Paulo (BR))

**Session Classification:** Poster Session

**Track Classification:** Heavy flavor and quarkonium