1. Physics Motivation

- Charm quarks are ideal probes of the QGP:
  - Produced in hard scatterings.
  - $p_T$-differential cross section calculable with pQCD-based models.

- $D^0$-tagged jets
  - Improve background jets rejection.
  - Investigation of the jet spectrum down to low $p_T$.
  - Study of the mass dependence of parton energy loss.

2. Tagging jets with $D^0$

- Exploiting the excellent particle identification capabilities of the ALICE detector. Kinematic and topological selections are applied to the $D^0$ candidates.
  - $D^0$ particles are reconstructed through the hadronic decay channel $D^0 \rightarrow K\pi$ with an invariant mass analysis.

- Jets are reconstructed using anti-$k_T$ algorithm. $D^0$ daughters are replaced by $D^0$ 4-momentum vector in jet constituents.

3. $D^0$-tagged jet $p_T$ spectrum

- Obtained by subtracting background from the signal region of the $D^0$ invariant mass analysis using the spectrum from the side-band region normalized by the background in the signal region ($N$).
  - $\text{Signal}_{\text{corr}} = \text{Signal}_{\text{raw}} - N \cdot \text{Background}$

- POWHEG+PYTHIA6 simulations are used to remove the feed-down contribution from bottom quark decays.

- Bayesian unfolding was applied in the $D^0$-tagged jet $p_T$ spectrum. The p-Pb measurement is used as reference.

4. Nuclear modification factor

- Indication of strong suppression of $D^0$-tagged jet production in central Pb-Pb collisions.

- $D^0$-tagged jet $R_{AA}$ compatible with the $R_{AA}$ of average $D$ mesons. Inclusive jets follow similar trend at high $p_T$.

- ALICE plans to extend the kinematic range and precision in this analysis using the 2018 data. This work is in progress.