Physics motivation
Study production mechanism of $^3$He in high-energy hadronic collisions by comparing results from different collision systems to existing models

- Test predictions on the elliptic flow of $^3$He in Pb-Pb collisions from coalescence [1] and Blast-Wave (BW) model [2].
- Add constraints to coalescence approach by measuring $^3$He production, $^3$He/p and $B_3$ vs. multiplicity in p-Pb collisions

$^3$He identification
$^3$He identification using the $dE/dx$ measured by the Time Projection Chamber (TPC)

- Excellent separation from other particle species

Secondary $^3$He from material
Secondary $^3$He produced by spallation in interactions between high-energy particles and the detector material

- Experimentally separated using the distance to closest approach (DCA) of the $^3$He track to the primary vertex

Results: $v_2$ in Pb-Pb collisions
Elliptic flow of $^3$He measured in Pb-Pb collisions for the first time

- Heaviest baryon whose flow is measured
- $n_q$-scaling is violated for all charged particles (observed also for deuterons in Pb-Pb collisions at 2.76 TeV [3]).

Results: $^3$He vs. multiplicity in p-Pb collisions
$^3$He measured in 4 multiplicity classes

- $^3$He/$^2$He consistent with 1 within uncertainties
- Coalescence parameter $B_3$: $^3$He consistent with 1 within uncertainties
- $^3$He/p increases with multiplicity
- Qualitatively explained by coalescence

References