Flash Talk:
Current status and future prospects of measuring hadronic interactions in pp collisions at 13.6 TeV with ALICE

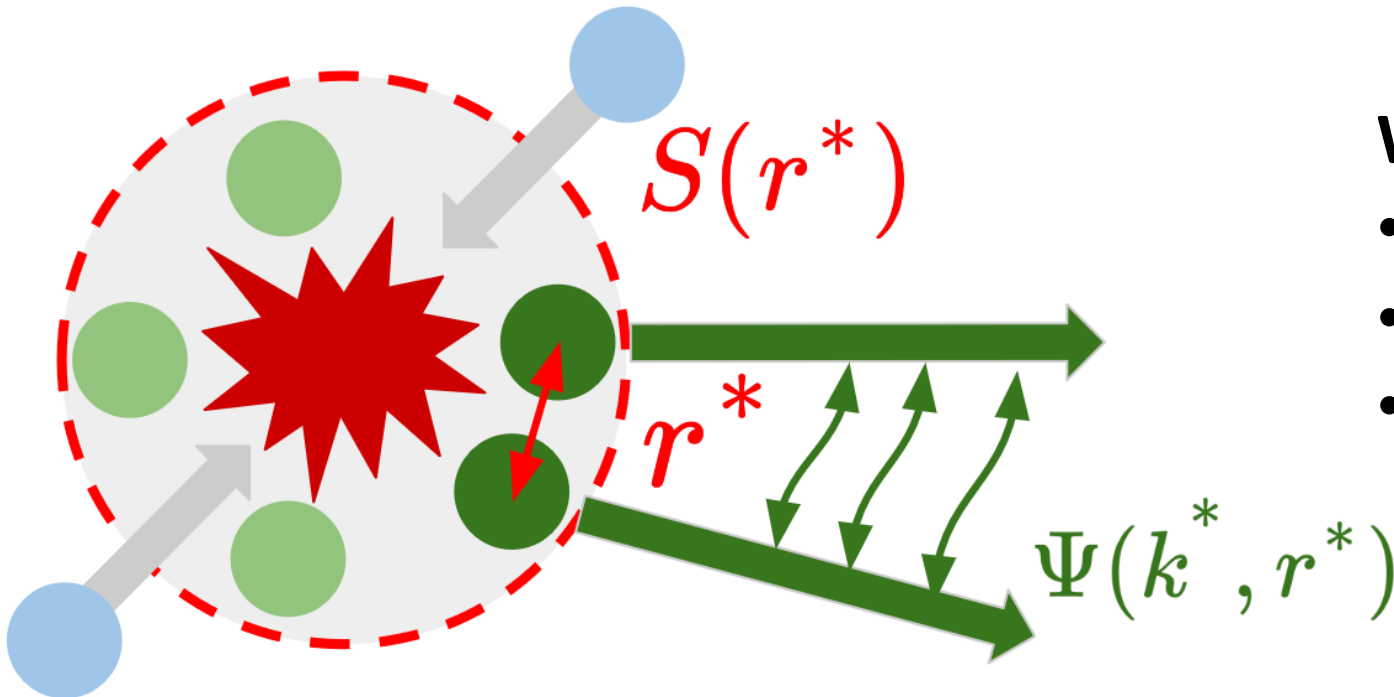**Anton Riedel**

on behalf of the **ALICE collaboration**

Technical University of Munich

Quark Matter 2023, Houston, Texas

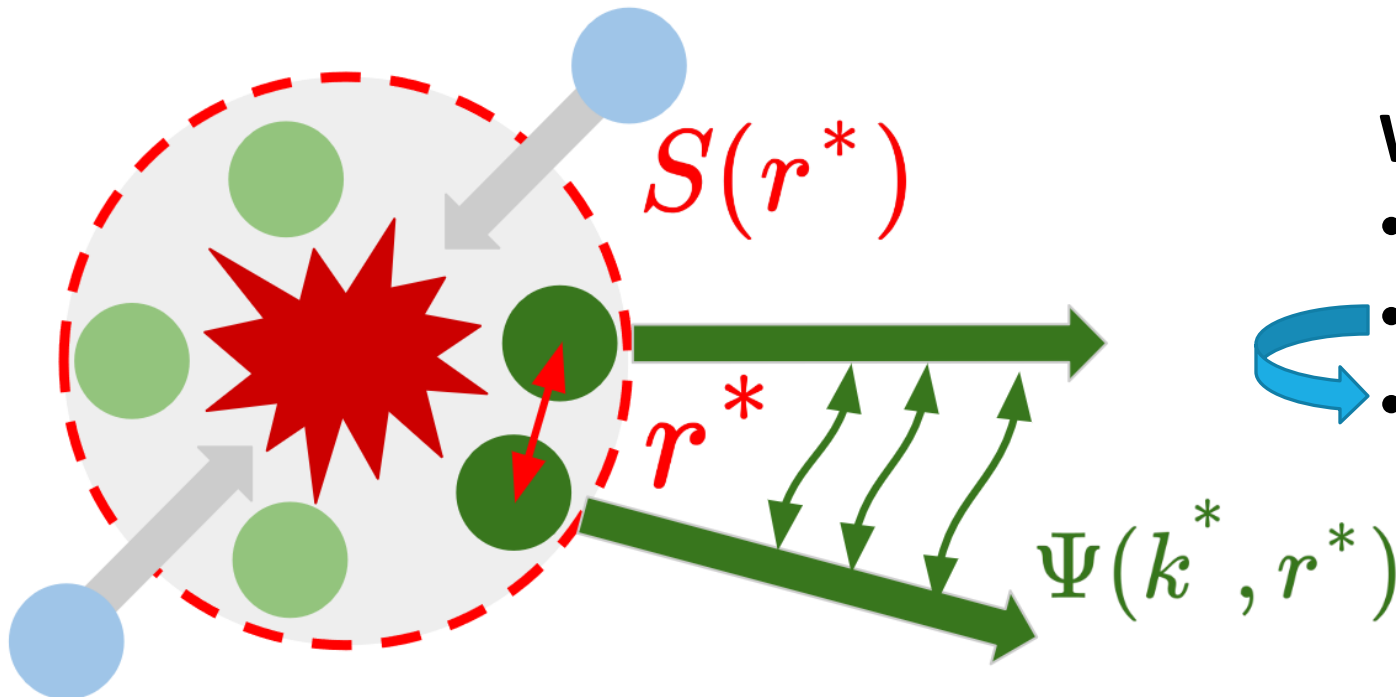# Accessing hadronic interactions with femtoscopy

$$C(k^*) = \mathcal{N} \frac{N_{\text{SE}}(k^*)}{N_{\text{ME}}(k^*)} = \int S(r^*)|\Psi(k^*)|^2 \, \mathrm{d}^3 r^* \xrightarrow{k^* \to \infty} 1$$

$S(r^*)$

r^*

$\Psi(k^*, r^*)$

Workflow for accessing interaction:
- Measure correlation function C(k*)
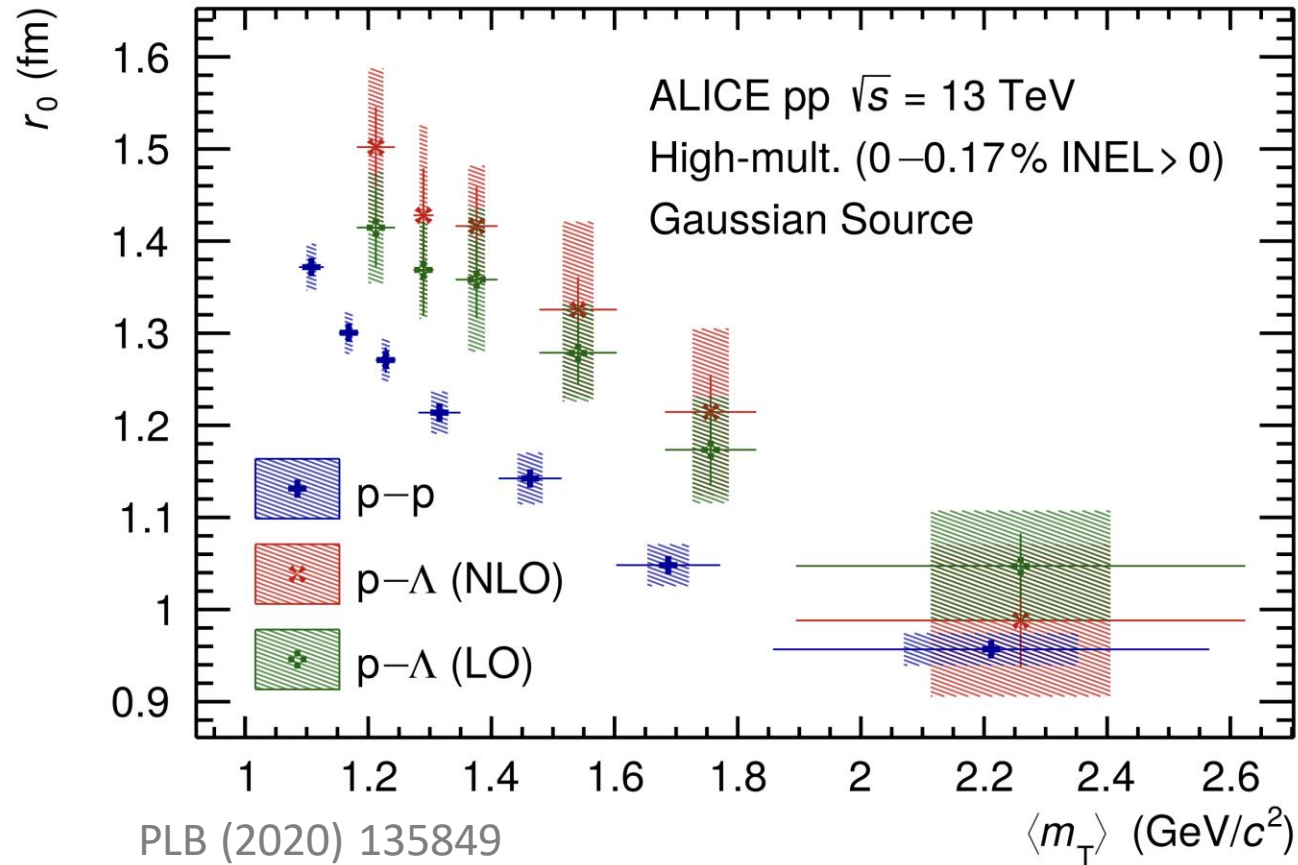- Fix source S(r*)
- Study interaction Ψ(k*)

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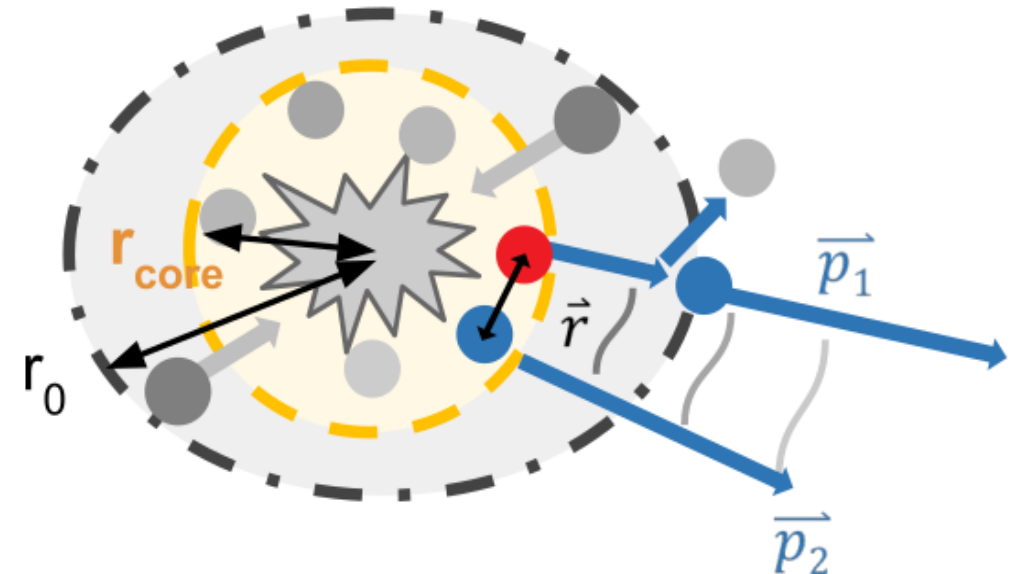

$S(r^*)$

r^*

$\Psi(k^*, r^*)$

Workflow for fixing the source:

- Measure correlation function C(k*)
- Fix interaction Ψ(k*)
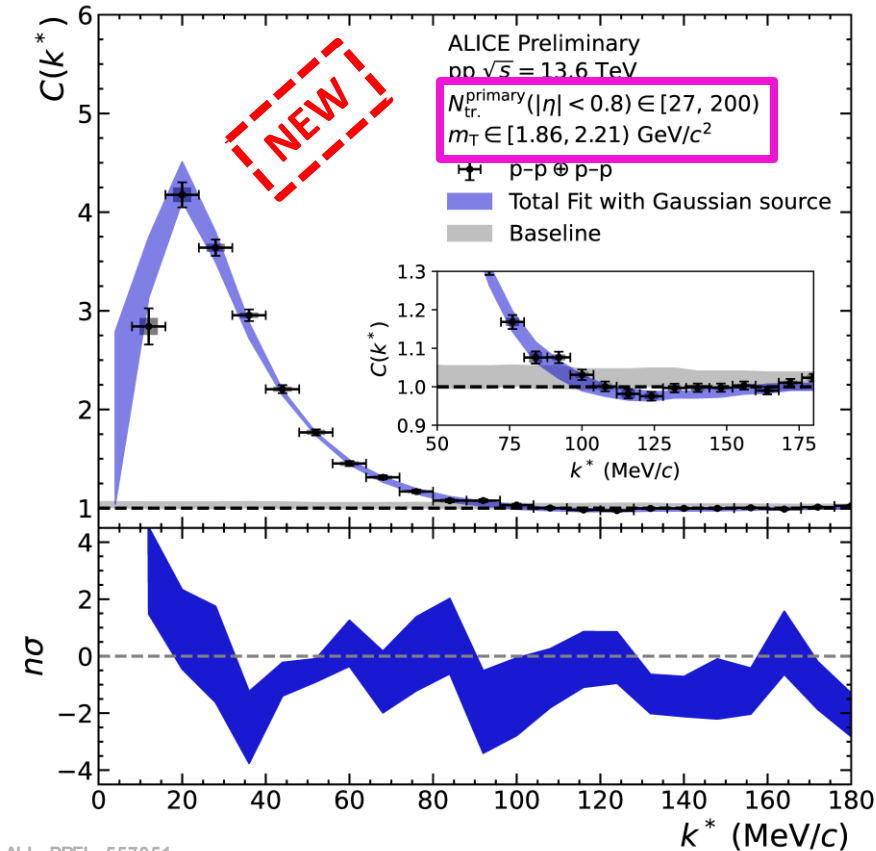- Study source S(r*)

Common baryonic source in pp collisions

How to constrain the source size:

- Measure **correlation function C(k*)**
- Fix **interactions Ψ(k*)** -> **p–p & p–Λ**
- Take **short-lived resonances** into account
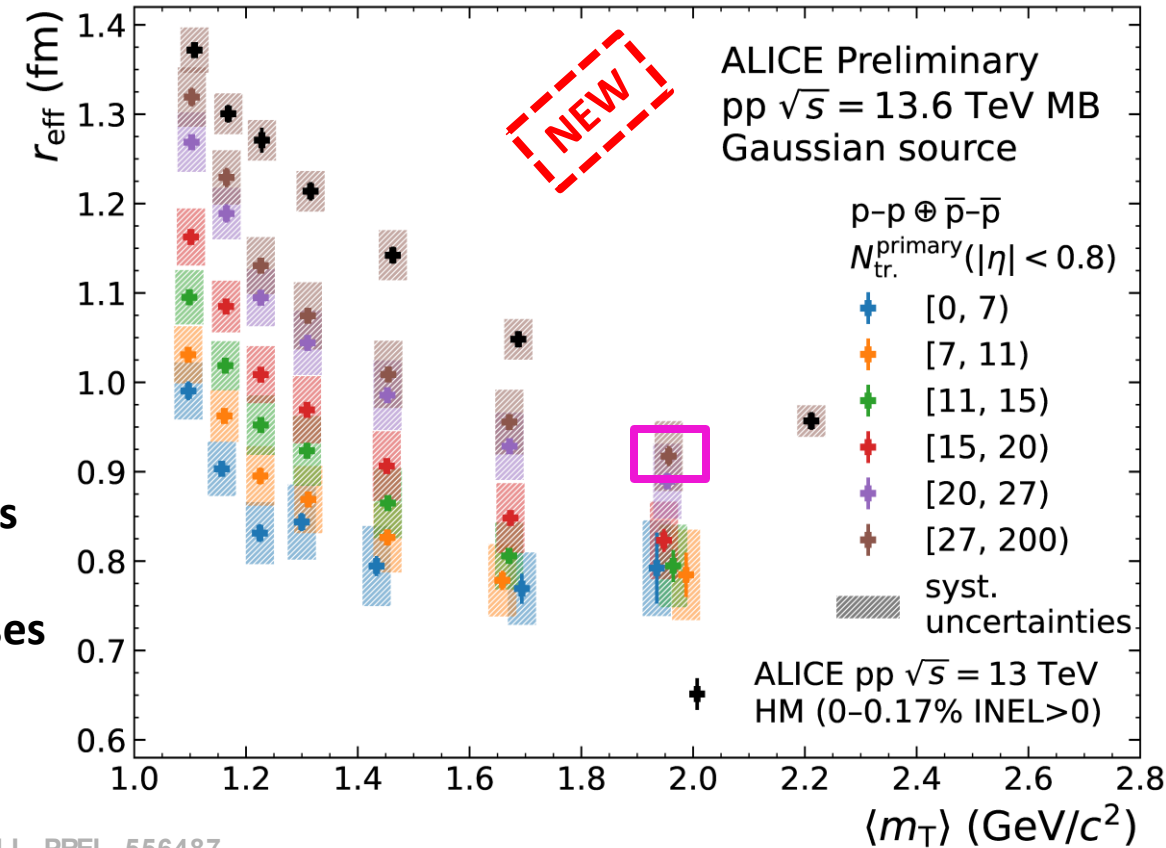- Extract **source** as a function of **m_T**

Current status:
Differential measurement of p–p correlations in Run 3

ALI - PREL- 557051

ALI - PREL- 556487

Observation:
Source radius increases
with increasing
multiplicity and decreases
for increasing m_T

Future of femtoscopy in Run3:

- Measurement of the p–p and of p–Λ in similar multiplicity class to Run 2 to benchmark Run 3 results
- Extend the common source model with multiplicity scaling of the source

=> **Source constrained for future femtoscopic measurements in Run 3 with ALICE**