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Statistical hadronization applied to particle yields in pp collisions at √s = 17.3 GeV

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Need for reanalysis of this system

Previous statistical analysis of particle yields in pp at **$\sqrt{s}$ = 17.3 GeV** (**T_{Beam} = 158 GeV**) was published in 2018. Since then NA61 measured 7 yields – 4 final: ϕ, $K(892)^0$, Ξ^{+-} and 3 preliminary: K^0_S, $\Xi(\bar{\Xi})^0$ (1530).

We combine the NA49 and NA61 results (treated separately in all the previous analyses), and account for their correlations (for details see TM, KP, J. Phys. G: Nucl. Part. Phys. 48 085004).

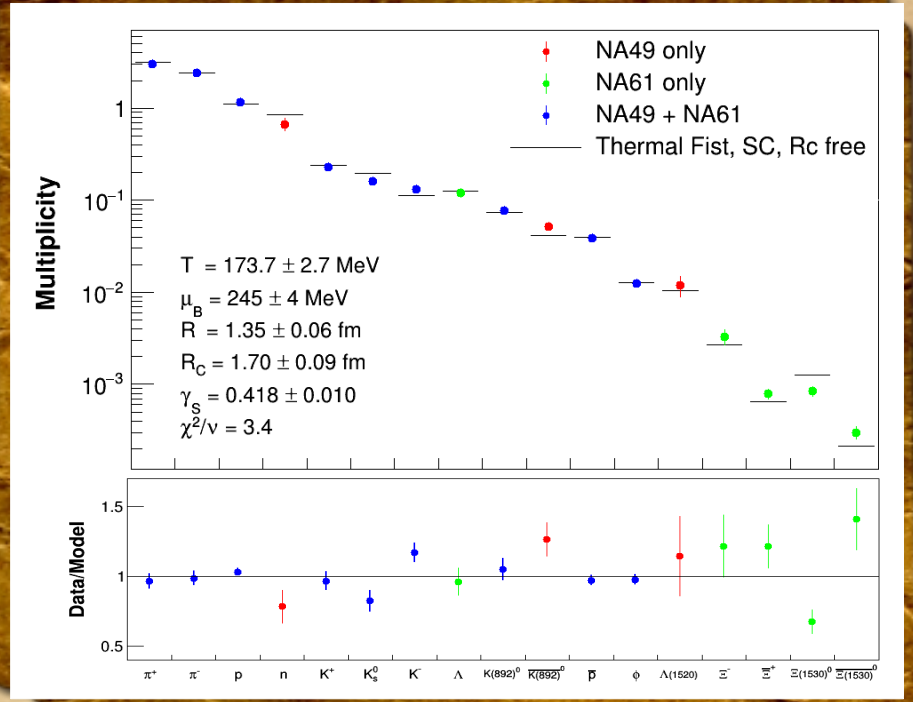
Applied method

We use the **ThermalFist** package for statistical model.
We include the light nuclei & hypernuclei, but exclude the charmed hadrons due to their negligible effect.

Compared to previous works, we use the **E-dependent widths of Breit-Wigner mass** distribution. We leave **γ_S open** for fitting.

We test the canonical ensemble applied to:
Ⓐ **strangeness only** or Ⓑ **all the hadrons** , and either
① **fix the canonical radius** to the global one or ② **leave it free**.

No scenario provides $\chi^2/\upsilon \approx 1$. Best is Ⓐ② ($\chi^2/\upsilon$ = 3.4).
$R_c > R$ by 3.2 std devs, not excluded by HBT measurements.



Statistical model describes these yields only approximately. Temperature parameter is 174 MeV.
Exclusion of ϕ mesons (helpful in previous analyses) is not needed. Largest deviation is for $\Xi(1530)^0$ and K^-. We encourage to measure the 'missing' yields, including π^0, η, ρ^0, $\bar{n}$, d ($\bar{d}$), $\bar{\Lambda}$, $\bar{\Sigma}(1385)$, $D^{0\pm}$, $\bar{D}^0$.