Fast-timing measurements in neutron-rich odd-mass zirconium isotopes using LaBr$_3$:Ce detectors coupled with GAMMASPHERE
Aim: Investigation of the deformed regions of the nuclear chart around mass $A \sim 100$ and $A \sim 150$

- A 34.4 $\mu$Ci $^{252}$Cf source at the focus of the 2 hemispheres
- A scintillator array made of 25 $\text{LaBr}_3:\text{Ce}$ detectors
- One hemisphere of GAMMASPHERE made of 51 Compton-suppressed HPGe detectors
- Digital acquisition for the entire $\text{LaBr}_3:\text{Ce}$ array for the first time
- 30-day long measurement → 18 Tera bytes of raw data (4 Tb when compressed)

Distribution of the fission products from the spontaneous fission of $^{252}$Cf
Fission fragment distributions for \(^{100}\text{Zr}\) and \(^{102}\text{Zr}\) obtained from even-A partners.

\[
\begin{align*}
\sigma &= 2.14 \\
\sigma &= 1.98
\end{align*}
\]
Example γ-γ matrix (LaBr$_3$:Ce - LaBr$_3$:Ce) of $^{100}$Zr after DGS gates on the $8^+ \rightarrow 6^+$ and $6^+ \rightarrow 4^+$ transitions. The peak is the coincidence between the $4^+ \rightarrow 2^+$ (start) and the $2^+ \rightarrow 0^+$ (stop) transitions.

Preliminary result: measured lifetime value within two standard deviations of the adopted value.

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