

# Lifetime measurements in the $A \sim 100$ mass region via the coincidence Doppler-shift attenuation method

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The coincidence Doppler-shift attenuation method (CDSAM) is a powerful technique for determining nuclear level lifetimes in the femtosecond regime [1,2].

At the SONIC@HORUS setup [3] at the University of Cologne, several  $(p,p'\gamma)$ - and  $(\alpha,\alpha'\gamma)$ -CDSAM experiments have been performed with a focus on the  $A \approx 100$  mass region, including Zr, Ru, Pd, Sn, and Te isotopes [4,5,6]. The combined SONIC@HORUS spectrometer allows for coincident detection of  $\gamma$  rays and backscattered beam particles, enabling background reduction, precise transition selection and feeding exclusion. From each experiment, dozens of lifetimes can be determined. Additionally, the analysis of particle- $\gamma$ - $\gamma$  coincidences enables thorough and comprehensive spectroscopy.

In this contribution, recent results on lifetime determination and spectroscopy will be presented, highlighting the benefits derived from coincidence measurements.

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