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## Observation of multi-phonon gamma vibrations in odd-odd nucleus

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Neutron-rich nuclei in the  $A \sim 100$  region show rapid change in shape as a function of both proton and neutron numbers. The shape of some of the even- $Z$  nuclei in this region also exhibits ellipsoidal oscillations, known as gamma vibrations. These gamma-vibrational bands are a measure of triaxiality and gamma softness in this region. Furthermore, the two-phonon gamma-vibrations also provide tests of Pauli principle. As part of a study of the evolution of the structure of even-odd and odd-odd neutron-rich Nb isotopes, the structure of  $^{104}\text{Nb}$  was investigated from two complementary methods: i) high statistics triple- and four-fold gamma coincidences from the spontaneous fission of  $^{252}\text{Cf}$  using Gammasphere and ii) prompt gamma from the induced fission of the  $^{238}\text{U}+^9\text{Be}$  reaction with isotopic fragment identification using the VAMOS++ and the AGATA spectrometers. Observation of multi-phonon gamma vibrations and shape coexistence of this odd-odd nucleus will be presented.

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