

Double-gamma decays of double-beta decay emitters: can they be measured?

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Recently, some theoretical nuclear structure works have pointed out the relation between the nuclear matrix elements of neutrinoless double-beta decay, a much sought-after nuclear decay that emits two matter particles without antimatter [1,2], and the corresponding matrix elements of double-gamma decay from the double isobaric analog states (DIAS) of the initial double-beta decay nuclei [3,4]. However, the DIAS appear at high excitation energies, and their double-gamma decay competes with faster decay channels such as particle emission or single-gamma decay, making their measurement very challenging.

In this talk I will present recent results [5] comparing the width of the double-gamma decay of DIAS of double-beta emitters and these competing channels, focusing on the lightest Ti48 but also covering heavier nuclei. Our preliminary results support the feasibility of measurements of double-gamma decay of DIAS, which can provide very previous insights on the nuclear matrix elements of neutrinoless double-beta decay.

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