



Contribution ID: 45

Type: **Poster**

## Search of the exotic nuclear two-photon emission decay in isochronous heavy ion storage rings

*Monday, 2 May 2022 20:10 (20 minutes)*

The nuclear two-photon ( $2\gamma$ ) decay is a rare decay mode in atomic nuclei whereby a nucleus in an excited state emits two gamma rays simultaneously. First order processes usually dominate the decay, however two-photon emission may become significant when first order processes are forbidden or strongly retarded, which can be achieved at the experimental storage ring ESR (GSI/FAIR). Within this work we will present the implemented methodology and the obtained results of two beam times performed in 2021, when for the first time the isochronous mode of ESR alongside non-destructive Schottky detectors were operated for the study of short-lived isomer production yields and lifetimes. We investigated specifically the isotope  $^{72}\text{Ge}$ , as it is the most easily accessible nucleus having a first excited  $0^+$  state below the pair creation threshold paramount for the study of  $2\gamma$  decay without competition of first order decays. In addition, the nuclei  $^{70}\text{Se}$  and  $^{72}\text{Br}$  were studied, as their isomeric states play a major role in nuclear astrophysics.

**Primary author:** FREIRE FERNÁNDEZ, David (MPIK, GSI, CEA)

**Co-authors:** AKINCI, Fatma Cagla; BLAUM, Klaus (Max-Planck-Institut für Kernphysik); KORTEN, Wolfram (CEA Paris-Saclay); LITVINOV, Yury (GSI Helmholtzzentrum für Schwerionenforschung GmbH(GSI)); SANJARI, Shahab (GSI Helmholtzzentrum für Schwerionenforschung GmbH(GSI)); COLLABORATION, E143

**Presenter:** FREIRE FERNÁNDEZ, David (MPIK, GSI, CEA)

**Session Classification:** Poster Session On Site