Lifetime Measurement of the ²⁶O g.s. at SAMURAI

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A recent experiment suggests that the ground state of the neutron-unbound nucleus ²⁶O could have a lifetime in the pico-second regime. This would constitute the first case of a radioactive decay via neutron emission, if this value can be confirmed.

In Dezember 2016, an experiment using a new measurement method to determine the decay lifetime of the ²⁶O ground state with high sensitivity and precision was performed at SAMURAI. Here, a ²⁷F beam was produced in the fragment separator BigRIPS and impinged on a W/Pt target stack where ²⁶O was produced. According to the lifetime, the decay of ²⁶O happens either in- or outside the target. Thus, the velocity difference between the decay neutrons and the fragment ²⁴O delivers a characteristic spectrum from which the lifetime can be extracted.

The current analysis status will be reported. This work is supported by the DFG through grant no. SFB 1245.

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