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## **Investigation of rare nuclear decays of naturally occurring osmium isotopes accompanied by $\gamma$ quanta.**

*Thursday 1 September 2022 15:30 (20 minutes)*

A search for rare nuclear decays of the naturally occurring osmium isotopes accompanied by  $\gamma$  quanta has been performed using an ultra-low-background germanium  $\gamma$  detectors and an ultrapure osmium sample at the Gran Sasso National Laboratory of the INFN (Italy).

The final results on the  $2\beta$  and  $\alpha$  decays of osmium isotopes obtained in three experimental stages will be presented in this talk.

During the data taking with the  $\gamma$  detector, no effect has been detected, and lower limits of the half-life of the naturally occurring osmium isotopes relative to  $\alpha$  and  $2\beta$  decays of  $^{184}\text{Os}$  and  $^{192}\text{Os}$  were set at the level of  $10^{15}\text{--}10^{20}$  yr.

In the case of  $\alpha$  decays of  $^{184}\text{Os}$  and  $^{186}\text{Os}$  to the first excited levels of daughter nuclei, the limits substantially exceed the present theoretical estimates of the decays probabilities. New experimental perspectives to detect the  $\alpha$  decays of  $^{184}\text{Os}$  and  $^{186}\text{Os}$  and improve the experimental sensitivity to the  $2\beta$  processes in  $^{184}\text{Os}$  and  $^{192}\text{Os}$  will be discussed.

### **Is this abstract from experiment?**

Yes

### **Name of experiment and experimental site**

N/A

### **Is the speaker for that presentation defined?**

Yes

### **Details**

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### **Internet talk**

Yes

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