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The SORGENTINA-RF project: fusion neutrons for medical radioisotopes and beyond

Tuesday, 21 March 2023 16:00 (2 hours)

The SORGENTINA-RF project is presented in terms of general structure and description of the main tasks and activities to be carried out. It is devoted to the design and development of a medium power 14 MeV fusion neutron source relying on a rotating target and a deuterium/tritium ion accelerator. The main focus of the neutron facility is the production of radiopharmaceutical precursors, in particular ^{99}Mo as precursor of ^{99m}Tc , a radio-tracer used in single photon emission computed tomography. The nuclear reaction involved in the production of ^{99}Mo is the inelastic reaction $^{100}\text{Mo}(n,2n)^{99}\text{Mo}$. The facility will assess the chain that starts with the irradiation of the natural molybdenum (where ^{100}Mo has an isotopic abundance of about 10%) up to the production of the so-called mother solution, a liquid solution named sodium molybdate. The facility will also make available fast and thermal neutrons beams for studies on innovative medical radioisotopes as well as materials.

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