ISOLDE Workshop and Users meeting 2022



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Operation and new development at the MELISSA laser lab in MEDICIS.

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The CERN-MEDICIS facility aim at producing exotic nuclear isotopes with high purity and specific activity, for medical application. The collection of the radioisotope of interest is performed either with a target irradiated by a 1.4 GeV proton beam from CERN's Proton Booster, or with an externally irradiated target provided by an external institution.

The Resonance Ionization Laser Ion Source (RILIS) technique is widely used in all radioactive ion beam facilities world-wide, as it provides high efficiency and selectivity for a wide range of isotopes of interests. This technique has been implemented at the MEDICIS facility trough the development of the MELISSA laser laboratory. Relying on 3 solid state Ti:Sa lasers coupled with intra-cavity Second Harmonic Generation, the MELISSA laser laboratory has delivered its first laser ion beam in April 2019 and has been operated since then for 80% of the collected radioisotopes in MEDICIS.

New laser developments are currently under investigation, with the double objectives of increasing the versatility and the stability of the MELISSA laser laboratory. To achieve these two objectives, new nonlinear processes (Sum Frequency Generation, Difference Frequency Generation) and new laser architectures are being studied, to determine the most reliable solution for the long-term optimization and routine collection of all the radioisotopes of interest at MEDICIS.

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