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An update report on the upgrade of the TCT - TPA/SPA experimental station at the ELI Beamlines facility

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The already approved concepts of TCT-TPA and TCT-SPA (both developed within the RD50 Collaboration) have been brought by the RD50 Montenegro team to the pan-European Research Infrastructure and laser facility ELI Beamlines in March 2020. RD50 Montenegro team partnered with RD50 teams from Slovenia, Italy, and the Czech Republic. The idea was to build an additional research TCT infrastructure for RD50 and a powerful and comprehensive research tool for wider community of users. The uniqueness will be the opportunity to use both, TCT-SPA and TCT-TPA techniques, with the possibility for the wavelength, power, and repetition of the fs- laser beam to be varied and tuned. Beside the TCT technique, a new research line such as the mortality study with high pulses is under development and the protocol may be standardized in the future. By exposing technology to a field that it has not been previously used for, new use cases for the technology may potentially emerge.
Within the ELI Beamlines department for Structural Dynamics the Ultrafast spectroscopy group possesses unique know-how and expertise, as well as cutting-edge laser technologies that are continuously being developed and refined. To the project they contribute state-of-the-art knowledge and technology transfer related to ultra-short pulse lasers, advanced spectroscopy methods and instrumentation. Experimental time at the ELI Beamlines facility is provided as part of the normal user operations (within the framework of the ELI access policies) and as part of in-house science and development projects. The know-how and the expertise potential of ELI is enhanced locally by the logistic help of the RD50 Czech collaborators. The sensors and readout boards, as well as expertise support are provided by INFN and JSI.
In June 2020, the first initial steps and the jitter study on LGAD using the fs- laser beam have been shown on the 36th RD50 Workshop. In the meantime, the significant investment in the experimental station was done by ELI RP4: Applications in Molecular, Bio medical and Materials Science. An access to ELI through an application by Montenegro team to ELI Open User Call was gained in September and after the application of Montenegro Rd50 team was selected Eli gave priority to the applied project. In this presentation we will give an update report on the upgraded TCT-TPA/SPA set up and discuss the plans towards future upgrades.

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