

Abstract

Charged-lepton flavour-violating (cLFV) processes offer deep probes for new physics with discovery sensitivity to a broad array of new physics models - SUSY, Higgs Doublets, Extra Dimensions, and, particularly, models explaining the neutrino mass hierarchy and the matter- antimatter asymmetry of the universe via leptogenesis. The most sensitive exploration of cLFV is provided by experiments that utilize high intensity muon beams to search for cLFV transitions: a muon decaying into an electron and a photon, (MEG experiment at PSI); a muon decaying into three electrons (Mu3e experiment at PSI); and the coherent neutrinoless conversion of a muon into an electron in the field of a nucleus, (Mu2e experiment at Fermilab and COMET experiment at J-PARC).

Scientists from JINR are participating successfully in the preparation stage of the Mu2e, COMET and MEG-II experiments. For Mu2e experiment JINR colleagues will continue to create CRV system, to perform E-cal front-end electronic tests, establish remote Control room, participate in data analysis and probably participate in the detector assemble and maintenance. For MEG-II experiment, our scientists will provide operation of JINR computer cluster, perform simulation, data analysis, creation of event display and support drift chamber operation. For COMET experiment JINR staff will produce all set of 5 mm straw tubes, participate strongly in the creation of straw-tracker, calorimeter and CRV system with further data analysis contribution.

During the 2015 – 2019 period of the projects (Mu2e and COMET), 44 papers with significant participation of JINR scientists concerning these experiments were published, more than 9 talks at international conferences and meetings were presented. The requested project budget is 1258 kUSD for 2021-2023.