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High-energy proton microscopy at INR proton linac (proposal)

Wednesday, 21 June 2017 16:00 (1h 45m)

Existing proton radiography facilities, constructed according to the scheme of high-energy proton microscope with image magnification, in USA , Russia and Germany clearly demonstrated the advantages of the high-energy proton radiography method compared to conventional X-ray techniques in the study of solid objects and dense plasma, especially in dynamic experiments.
The new proton microscope for an investigation of fast dynamic processes with areal density of targets up to 5 g/cm^2 is under designed on the basis of high-current proton MMF linear accelerator at Institute for Nuclear Research (Russia, Troitsk). With this setup, by using of 247 MeV proton beam plan to investigate of solid targets and shock-wave processes in dynamic. MMF accelerator designed to operate at frequencies up to 100 Hz will let to explore the slow-changing dynamic processes such as crystallization and melting.
The optimum parameters of ion optics of proton microscope were calculated by Cosy Infinity code. The full-scale Monte-Carlo numerical simulation of experiments with shock compressed Xe gas and docosane was performed by Geant4 toolkit. The results of visualization of copper and organic-glass step wedges static targets also described at this work.

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Session Classification: Poster Session with Coffee break