

Abstract Submitted
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Simulation Studies of Hydrodynamic Tunneling of 440 GeV Protons Generated by Super proton Synchrotron at CERN N.A. TAHIR, GSI Darmstadt, Germany, J. BLANCO SANCHO, CERN, Geneva, Switzerland, A. SHUTOV, IPCP Chernogolovka, R. SCHMIDT, CERN, Geneva, Switzerland, A.R. PIRIZ, UCLM, Ciudad Real, Spain — Super Proton Synchrotron (SPS) is used as injector to the Large Hadron Collider (LHC) at CERN. Each LHC beam carries 362 MJ energy, sufficient to melt 500 kg copper. Safety of operation is thus a critical issue and simulations have been performed to study the damage caused by full impact of one LHC beam on solid materials. In order to validate these simulations, similar work has been carried out using the SPS beam which will be compared with the fixed target experiments at the HiRadMat facility using the SPS beam. The simulations have shown that the range of the LHC as well as the SPS protons is substantially increased due to hydrodynamic tunneling, an extremely important phenomenon. This work has shown that the beam heated region of the targets are converted into strongly coupled plasma which suggests that the HiRadMat facility can also be used to study Warm Dense Matter.

Naeem Tahir
GSI Darmstadt

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