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High-energy beamline for delivering H- laser stripped proton beam to LANSCE experimental area

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A unique feature of the current LANSCE accelerator facility is acceleration of four H⁻ beams (differing in time structure) and one H⁺ beam. This is achieved by utilization of an injector system based on two ion sources (H⁺/H⁻), and a combination of chopper and RF bunchers in the Low Energy Beam Transports. Since the end of 1990's, the large LANSCE experimental, Area-A, has been largely unused. In order to restore usage of Area-A, we have been exploring the possibilities of bringing low-intensity power beams into Area-A*. The proposal is based on partial stripping of the 800 MeV H⁻ beam that is transported to the Weapons Neutron Research Facility, and to deliver the resulting 10 –100 nA proton beam to Area-A. The appropriate place for generating proton beam was found to be the beginning of Line D after LANSCE Switchyard by first neutralizing the beam from H⁻ to neutral hydrogen beam ahead of the bending magnet using a laser, and then by fully stripping the neutral hydrogen beam to protons utilizing a stripper foil. The paper discusses design details of the proposed high-energy beamline and beam parameters.

Funding Agency

Footnotes

*S.A. Wender, E. Guardincerri, D. Tupa, Y.K. Batygin "Development of Low-Power Proton Beam Capability in Area-A", LANL Report 2022.

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Yes

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