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The Jefferson Laboratory program at 12 GeV

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CEBAF at Jefferson Lab (USA) is an electron accelerator devoted to basic research in hadronic physics in order to understand the strongly interacting matter. It is based on superconducting cavities and capable of delivering a “continuous” (pulses spaced of 2 ns), highly polarized beam of present maximum energy of 6 GeV to three experimental halls A, B, C. The design features and excellent performance of the accelerator made it possible to plan an upgrade in energy to 12 GeV without substantially altering the construction scheme of the accelerator. The program includes the construction of major new experimental facilities for the existing halls and the construction of a new experimental hall. The project will be completed by the year 2013 and the commissioning of the experimental halls will be extended until the end of 2015.

The research program that has motivated the upgrade in energy to 12 GeV includes: the study of the nucleon “tomography” through the study of generalized parton distribution functions (GPDs) and transverse momentum dependent distribution functions (TMDs), the study of exotics and hybrid mesons to explore the nature of the quarks confinement, precision test of the Standard Model through parity-violating electron scattering experiments. In this presentation an overview of the experimental program will be presented, with particular emphasis to the research program of the experimental halls A and B.

Presenter: ROSSI, Patrizia (LNF)

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