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PIP-II Accumulator Ring - PAR

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The FNAL accelerator complex is poised to reach MW neutrino beams on target for the exploration of the dark sector physics and rare physics program spaces. Future operations of the complex will include the CW capable PIPII linac at beam intensities that have not been seen before [1, 2]. The ambitious beam program relies on multi-turn H– injection into the FNAL Booster and then
extracted into delivery rings or the Booster Neutrino Beam (BNB) 8 GeV HEP program. These programs will utilize about 1.5% of the PIPII capabilities. Additionally, there are many accelerator engineering challenges that are already known and many that will be discovered. This proposal calls for an intermediate step that will both facilitate the operation of Booster in the PIP-II era, gain operational experience associated with high power injection rings and jump start FNAL beam based dark sector physics program. The PIP-II Accumulator Ring (PAR) is being designed to deliver several hundred kW beam power for a dark sector (DS) program with flexible bunch structures. This step includes the design, construction and installation of a 0.8 GeV accumulator ring (upgradeable to 1+ GeV) to be located in the PIP-II Booster Transfer Line (BTL). The PIP-II accumulator ring (PAR) may be primarily designed around permanent magnets or use standard iron core magnet technology with an aperture selected to accommodate the desired high intensity protons at 0.8 GeV.
PAR will leverage the power of PIPII and create and exciting DS program by the end of the decade.

Attendance type

In-person presentation

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