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Nucleon structure physics at Fermilab and J-PARC

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Experiments with a proton or hadron beam and a fixed target give a unique opportunity to study nucleon structure. They can provide information not at a very small Bjorken- x region, but at a mid or large x region. In addition, proton-induced experiments can probe anti-quark distributions via the Drell-Yan reaction. Making use of these characteristics of the proton beams, a series of experiments at Fermilab, a major proton lab in the world, with its 800-GeV proton beams has generated remarkable results. Currently a new experiment with the 120-GeV proton beams, E906/SeaQuest, is being carried out at Fermilab, one of whose goals is to measure the $d\bar{b}$ / $u\bar{b}$ distribution at a larger x region. Also at J-PARC, another major proton lab, experiments to study nucleon structure with hadron beams are under consideration. As J-PARC is a high-intensity proton accelerator complex, it can generate intense secondary beams such as pions and kaons. A high-momentum beam line is being constructed at the Hadron Experimental Facility of J-PARC, which will be suitable for nucleon structure experiments. In this talk, after reviewing results from past Fermilab experiments, prospects of the SeaQuest and the J-PARC experiments will be discussed, as well as the facility status and plan.