

J-PARC Synchrotron Achieves 3GeV

Recently, the Japan Proton Accelerator Research Center (J-PARC) achieved the initial performance target of 3GeV for its rapid-cycling synchrotron (RCS, 3GeV energy), a second-stage accelerator at the center.

The RCS (see photo) is capable of accelerating neutron beams injected from the Liniac at 181MeV (about 0.50c, the speed of light) up to 3GeV (about 0.97c) in 0.02sec -- the quickest in the world. On October 26, beams were injected from the Liniac and successfully completed the circuit. The RCS at J-PARC thus achieved its initial performance target earlier than expected.



The Center's synchrotron, which measures some 350m in circumference, generates 3-GeV proton beams with a maximum intensity of 1MW and a repetition rate of 25Hz. In order to realize approximately twice the conventional acceleration, the RCS incorporates a new-type vacuum duct made of alumina ceramic and a high-frequency acceleration system using a new magnetic material. J-PARC's achievement of the initial performance target demonstrates the validity of these new technologies as well.

After conducting more beam tests, the Center will inject beams from the 3-GeV RCS to the Materials and Life Science Facility (MLF) and the 50-GeV synchrotron some time next spring. Starting in the latter half of 2008 and continuing in FY09 (which begins on April 1, 2009), various research will be carried out using neutrons, mesons and neutrinos.

Editor: Noriyuki Ishii, JAIF