



Beijing Electron Positron Collider Luminosity Sets World Record

2:29 pm, April 5 of 2016 witnessed the luminosity of the Beijing Electron Positron Collider (BEPCII) successful hit $1 \times 10^{33} \text{cm}^{-2} \text{s}^{-1}$. This is not only a new landmark for BEPCII, which is now 100 times sharper than before it was upgraded, but also the highest luminosity ever achieved by an accelerator in this energy region.

After recovering from some faults in its hardware system and beginning high energy data taking at the BESIII detector earlier this year, BEPCII has been running in a very good condition. From March 25, scientists and technicians from the Institute of High Energy Physics (IHEP), CAS started a new run of machine study at BEPCII. After commissioning of the luminosity day and night, they finally achieved this major breakthrough on April 5th.

BEPCII is a double-ring e^+e^- collider running at the tau-charm energy region ($E_{\text{cm}} = 2.0\text{--}4.6 \text{ GeV}$), which, with a design luminosity of $1 \times 10^{33} \text{cm}^{-2} \text{s}^{-1}$ at the beam energy of 1.89 GeV, is an improvement of a factor of 100 over its predecessor, BEPC.

The installation of BEPCII was completed in the summer of 2005. The collider consists of two 237.5 m storage rings, one for electrons and one for positrons. They collide at the interaction point with a horizontal crossing angle of 11 mrad and a bunch spacing of 6–8 ns. Each ring can accommodate up to 120 bunches with a beam current of 910 mA. The machine will also provide a high flux and brightness of synchrotron radiation at a beam energy of 2.5 GeV with the dedicated synchrotron radiation mode.

In July 2008, the first collisions took place at BEPCII, and were observed by the new BESIII detector.

In July 2009, BEPCII passed the National Acceptance & Test organized by the National Development and Reform Commission, which marked the completion of the upgrade on schedule.

During the past years, the luminosity of the BEPCII was increased from $5.21 \times 10^{32} \text{cm}^{-2} \text{s}^{-1}$ in 2010, $6.49 \times 10^{32} \text{cm}^{-2} \text{s}^{-1}$ in 2011, $7.08 \times 10^{32} \text{cm}^{-2} \text{s}^{-1}$ in 2013 and $8.53 \times 10^{32} \text{cm}^{-2} \text{s}^{-1}$ in 2014. (Based on IHEP news release)

