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Beam size measurement of the stored electron beam at the APS storage ring using pinhole optics

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Beam sizes of the stored electron beam at the APS storage ring were measured using pinhole optics and bending magnet x-rays in single-bunch and low-current mode. A white-beam pinhole of 25 μm and a fast x-ray imaging system were located 23.8 m and 35.4 m from the source, respectively. The x-ray imaging system consists of a $CdWO_4$ scintillation crystal 60 μm thick, an optical imaging system, and a CCD detector. A measurement time of a few tenths of a second was obtained on a beam of E>30 keV and 2 mA current. The resolution of the pinhole imaging system was evaluated to be 16 μm. The measured vertical and horizontal sizes of the electron beam were in reasonable agreement with the expected values.

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