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Design and field performance of the octupole magnet with skew quadrupole component in HEPS

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Abstract: The High Energy Photo Source (HEPS) is been built in China and the magnets are in batch production. The octupole magnets with skew quadrupole component used in the storage ring have been designed and manufactured. This magnet has an aperture of 30mm, a field gradient of 735000 T/m³ and a length of 0.26m. Different design schemes are compared. The magnet consists of 2 yokes and 4 movable poles, with 4 water cooled loops. Two prototype magnets were measured with a hall probe and a rotating coil measurement system. The influence of the combined power-on mode on the magnetic field is studied. The temperature rise curve and the temperature effect on magnetic center and the integral field are also given.

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