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The beam based alignment mover in High Energy Photon Source

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In the HEPS (High Energy Photon Source) storage ring, sextupole Movers are employed for Beam Based Alignment. These adjustments serve crucial purposes such as correcting the Optics parameters of the beam and boosting the beam's stability and transmission efficiency. The HEPS Movers are subjected to a heavy load and demand high precision. When attaining a positioning accuracy of $5\ \mu\text{m}$ in both the transverse and vertical directions, the mechanical stability of the magnets must be maintained. Following the development and testing of prototypes featuring three distinct structures, the model suitable for engineering implementation was finalized. Subsequently, the machining, testing, and installation of a substantial quantity of engineering Movers were carried out. Considerable efforts have also been made regarding radiation protection and operational safety for the HEPS Movers. Moreover, from a physical perspective, it is necessary for 288 Movers to move in synchrony, meaning they should start and stop at the same time, with the synchronism requirement being better than 100 milliseconds. To fulfill this requirement, HEPS has adopted a stepwise movement approach.

Footnotes

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