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The Magnetic Center Alignment Based on FECR Superconducting Ion-source After Cryostat Installation

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The magnetic center alignment is extraordinarily important before put a new ion-source into operation. Misalignment of ion-source may cause arc chamber destroyed. We take two methods to measure and align the ion-source superconducting magnet based on the cryostat bore in IMP. The required offset between ion-source magnetic center and mechanical center of warm bore is less than 0.5mm.

The FECR superconducting magnet consists of a sextupole magnet and four solenoid magnets. All of these component magnets are required to installed and aligned precisely based on the same mechanical axis. We set an adjustment unit to correct the position of ion-source magnet constitution in the cryostat after integral installation.

Two different measurement methods are adopted for the alignment of two kinds of coils. The harmonic coil is taken to measure the offset in the X and Y direction of sextupole. And the Hall sensor is used to measure the offset of four solenoids. Both the harmonic coil and Hall probe are mechanically related to the warm bore of cryostat. Compared result of these offset measurements, we choose a best correction scheme to adjust the magnet constitution to fit the mechanical axis of cryostat bore.

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