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Alignment of the CESR interaction region qudrupole magnets using vibrating wire technique.

Interaction region of Cornell Electron Storage Ring (CESR) electron-positron collider consists of two permanent and four superconducting quadrupole magnets. During summer shutdown of 2003 all these magnets were realigned using vibrating wire (VW) technique. In situ we measured magnetic center position of the magnets analyzing standing waves excited by Lorentz forces on the wire stretched through the interaction region. Then the data was used for precise alignment of the magnets and for beam trajectory calculation.
Although the precision of the magnetic center position measurement was better than 0.025mm, the difficulties of accurate moving of the magnets reduced the overall alignment precision to ˜0.08mm in horizontal plane and ˜0.14mm in vertical. The following beam based measurement confirmed the high-quality alignment of the CESR interaction region quadrupole magnets.
In presentation we will discus theory, setup, alignment procedure and results.

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