

XFEL projects:

- 1) Characterization and fiducialization of Undulator Quadrupoles
- 2) High precision temperature measurementsystem for XFEL undulator gap compensation

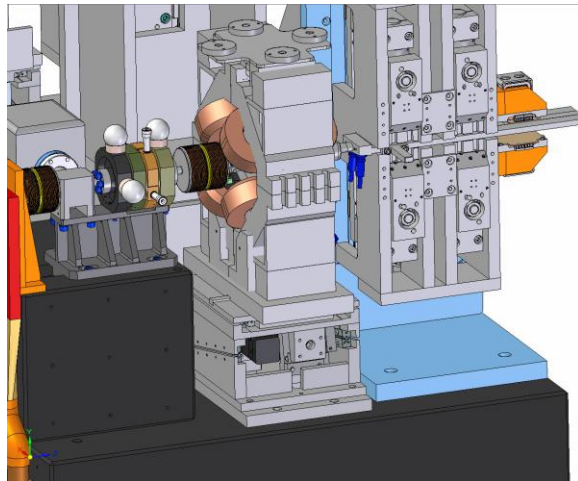
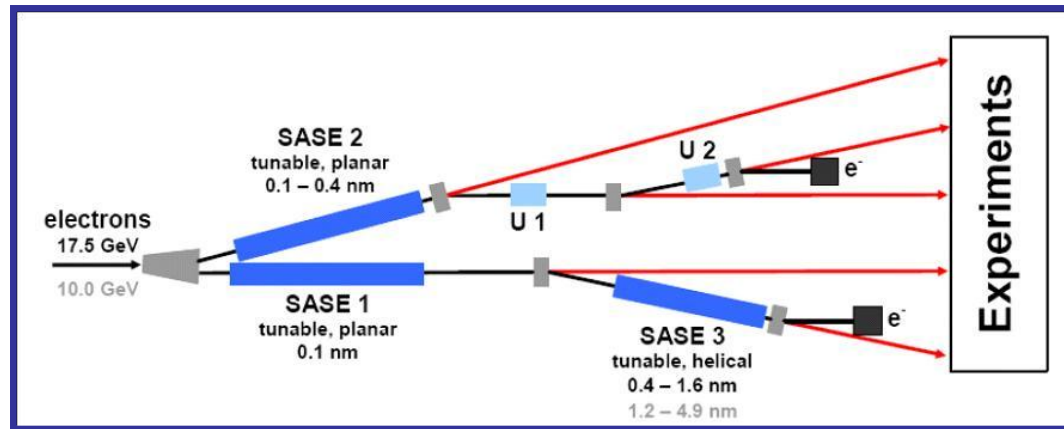
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European XFEL

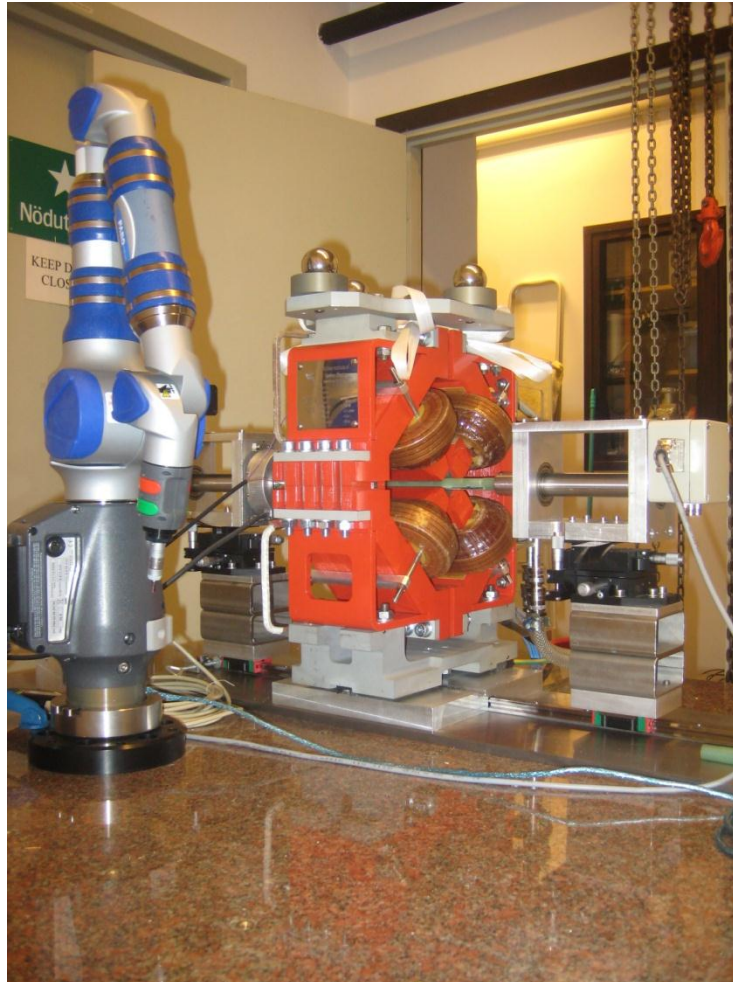


Project description:

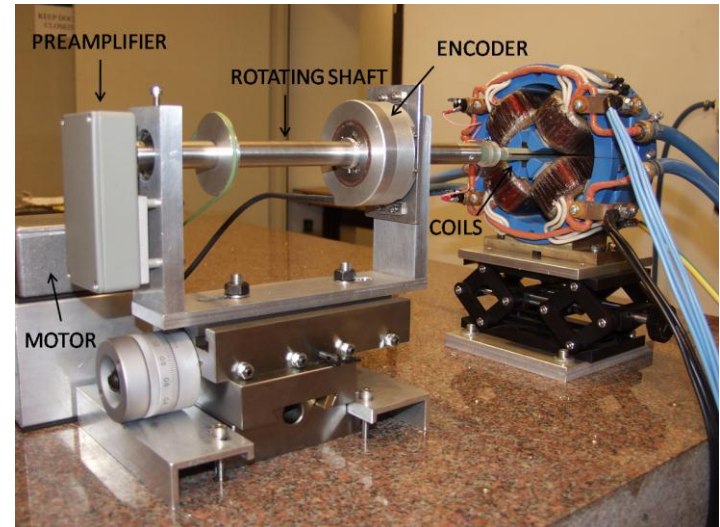
- Build a setup that can fiducialize the XQA magnets better than $50 \mu\text{m}$ ($< 2 \mu\text{m}$ after BBA).
- Fiducialize and characterize approximately 127 XQA magnets.

Intersection between 5m undulator modules

Rotating coil setup and FaroArm



New Setup



Previous Setup

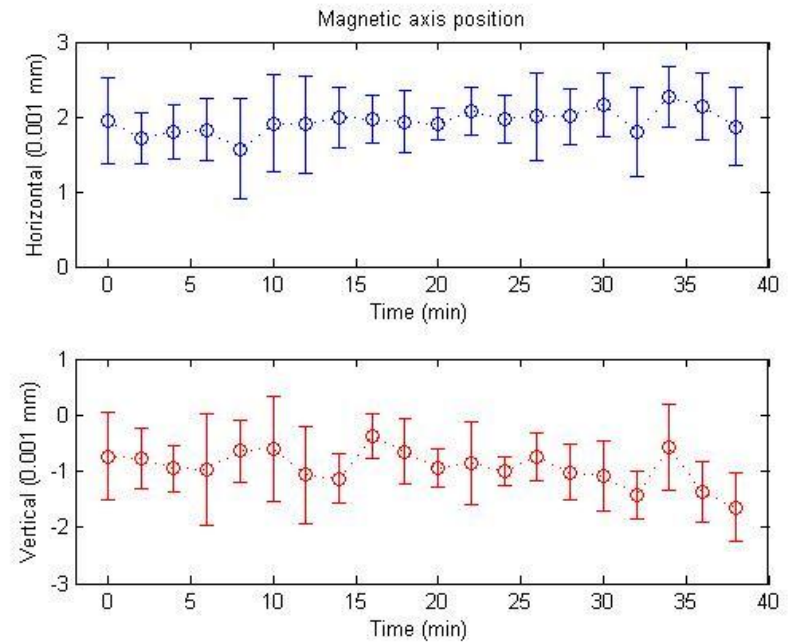
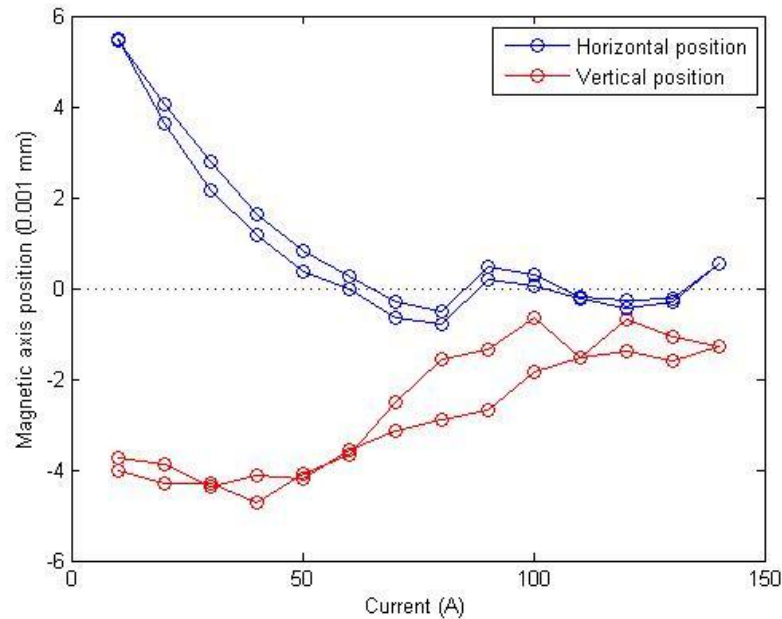


Circuit board coils

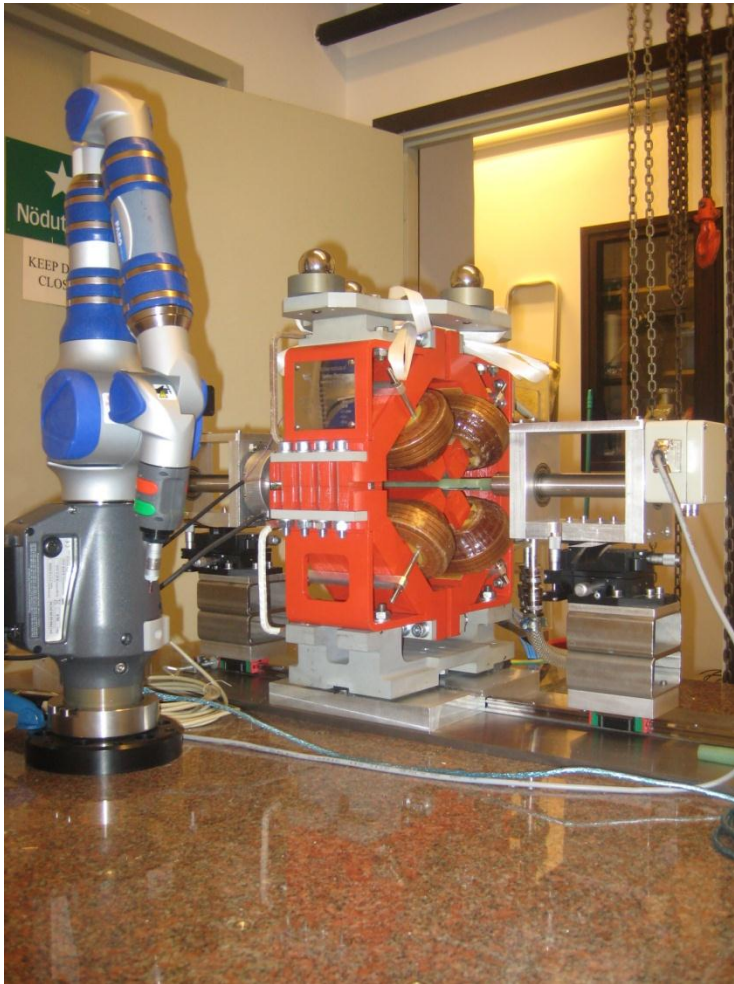
Analysis

$$V_{FA} = \frac{1}{\sqrt{R^2 + Q^2}} \quad r = R \frac{\sqrt{R^2 + Q^2}}{\sqrt{R^2 + Q^2}}$$

First result XQA001: Magnetic center position



Fiduzialization



Platinum Faroarm

- Portable coordinate measuring machine with accuracy $< 18 \mu\text{m}$ over 1.2 meters.
- Magnetic center measured with accuracy $\pm 20 \mu\text{m}$.
- Geometric center measured and compared with magnetic center.

Framtiden

- Två prototypmagneter XQA001,XQA002 uppmätta.
- Första 10 kvadrupoler på väg från Novosibirsk.
- Alla 127 magneter ska vara uppmätta innan sommaren 2012.