MQXFB121 OR+Midplane alignment investigation

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Outline

• Standard MQXFB alignment (OR+slot)
• MQXFB121 standard reported values
• Investigated alignment (OR+midplane)
• MQXFB121 OR+midplane
• Key average deviation
Standard MQXFB alignment

- Coil cross-section alignment scheme used at CERN (TE-MSC-LMF) throughout the MQXFB coil prototyping/production,
- Cross-sections aligned with use of the Outer Radius and Key Slot,
- The alignment is used in order to compute average midplane excess for left and right midplane, as shown on the right.
MQXFB121
standard report

- Large L-R triggered additional investigation
Investigated MQXFB alignment

- Investigated coil cross-section alignment scheme,
- Cross-sections aligned with use of the Outer Radius and Left and Right Midplanes,
- The alignment is used in order to compute average midplane excess for left and right midplane, as shown on the right.
Slot deviation sign

- More material -> positive deviation
MQXFB121 OR+Midplane

- Key deviation, Slot width

![Graph showing key deviation and slot width deviation over coil length](image-url)
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- Key average deviation
Summary

- MQXFB L-R summary boxplot
- L-R deviation of $\geq \pm 300\,\mu m$ triggers the additional analysis using OR+midplane alignment
- *KeyLeft* or *KeyRight* deviation of $\geq \pm 250\,\mu m$ triggers NCR on the coil
- In case of NCR, the asymmetry can be compensated during the assembly process by machining of the key