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Hidden Magnets Measurement and Alignment System for a High Radiation Area at FAIR –Part II: Design and Benchmarking

In the Facility for Antiproton and Ion Research in Europe (FAIR) the survey and alignment of some magnets in a high radiation area is critical. The lack of both accessible space for any permanent measurement system for radiation protection constraint and the direct line of sight imposes the use of alternative solutions. A novel hidden point measurement system FiBS (Fiducial Bar System) has been developed: a set of four customized Carbon Fiber-Reinforced Polymers (CFRP) rods. Furthermore, an alternative commercially available hand-held device has been adapted: The T-Probe from Leica Geosystems equipped with an unconventional homemade stylus 1.6m length. For both of them are described in detail the constraints, the accuracy achievable, compensation and measurement tests, risk assessment, cost and time.

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