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Metrology, alignment & fiducialisation

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Fiducialisation is an essential part of the alignment process for an accelerator component that need to be aligned within tolerances greater than the component mechanical assembly precision. This step establishes the relationship between the physical object as it has been built and the theoretical slot it should occupy inside the machine. It defines how the functional features, such as lamination, blades, electrodes, or flanges, are related to the theoretical beam axis, and how the component should be aligned. Furthermore, fiducialisation transfers this internal information to reference targets outside the component, easily visible and measurable during the alignment process in the tunnel. It is part of the error budget among the different sources along the whole process. The lecture will introduce the requirements, concepts and technologies used at CERN, and give an overview of the most important and critical aspects from the production up to the final alignment.

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