

Development and validation of raschain alignment systems for the pre-alignment of CLIC

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Raschain alignment system is under development at NIKHEF for the pre-alignment of CLIC. It is a combination of two 3 point alignment systems: RasNik system, consisting of a coded mask illuminated by LED and projected on a CCD through a lens, and RasDif system, where the coded mask & LED are replaced by a laser, and a diffraction plate replaces the lens. Different applications of Raschain are under study: firstly, as a short range alignment system providing a determination of the transverse position of components with a precision and accuracy better than 5µm rms over 10m; secondly, as a long range alignment system providing a determination of the transverse position of the components with a precision and accuracy better than 5µm rms over 200m, and thirdly, combined with elaborated mechanics, allowing the monitoring of the position of the final focus magnets through the detector, to a precision of 5µm rms. This paper presents the first prototypes of Raschain alignment system, the test setups and their associated results. In addition, the next steps of validation are introduced: inter-comparison on short range (4m) and long range (140m), as well as the strategy foreseen for their calibration.

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