Internal alignment characterization of accelerating structures of Compact LInear Collider

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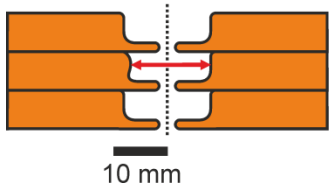
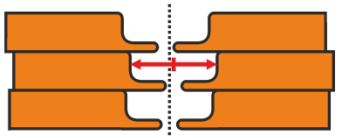
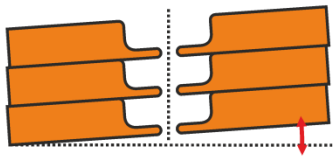
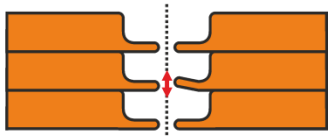
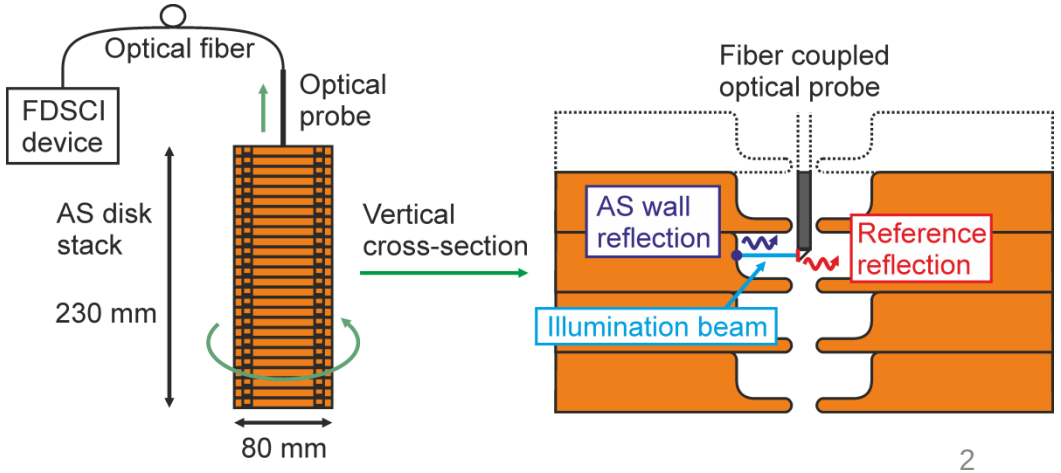
Introduction

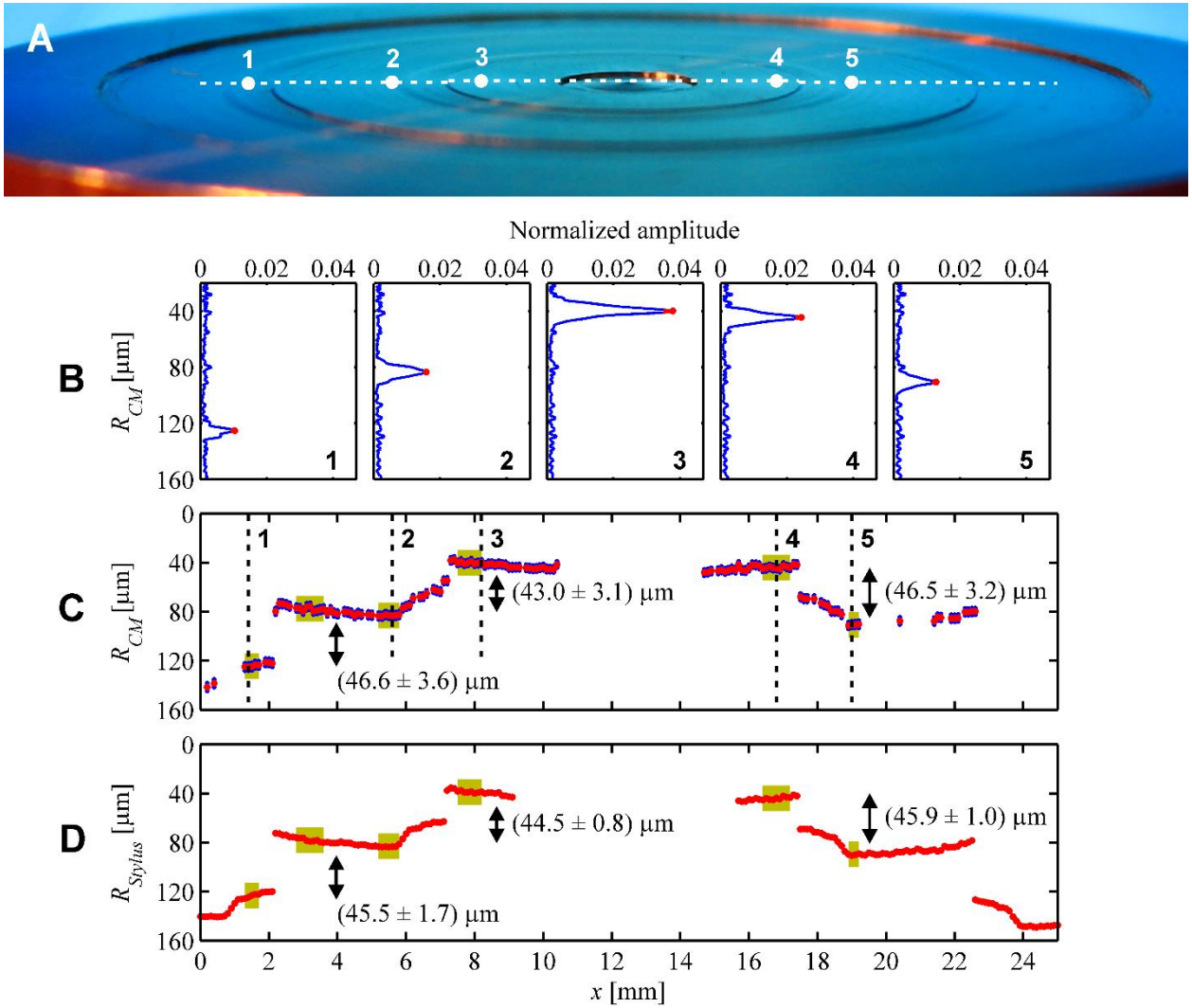
- Micrometer-level misalignments inside the Accelerating structures (AS), comprising of stacked copper disks, reduce the performance of the Compact Linear Collider (CLIC).

	Error in inner diameter	Transversal offset	Tilt	Iris deformation
Shape error				
Tolerance	1 µm	5 µm	140 µrad	

- Sub-micron accuracy across 10 mm measurement range is required.
- Fourier Domain Short Coherence Interferometry (FDSCI) -technique



Step height measurement using FDSCI



R. Montonen, I. Kassamakov, E. Hæggström, and K. Österberg, "Quantifying height of machined steps on copper disk using Fourier domain short coherence interferometer," in Optical Measurement Systems for Industrial Inspection IX, P. Lehmann, W. Osten, and A. Albertazzi G. Jr., Eds., *Proc. SPIE* **9525**, 95253L, Munich, Germany (2015).