



Contribution ID: 199 Contribution code: WEP34

Type: Poster Presentation

KB mirror mechanics innovations for optimal nanobeam focus and stability at the ESRF ID01 beamline

Wednesday 17 September 2025 17:00 (1 hour)

The highly coherent beam delivered by the Extremely Brilliant Source allows improving beam quality and size on long nano-beamlines. To benefit from this upgrade, the focusing mirrors of the Kirkpatrick-Baez (KB) and its mechanics were redesigned to improve the nano-beam stability in the versatile experimental setup of ID01 beamline. The optical design to get a 50nmx50nm beam lead to two fixed focused elliptical mirrors with a multilayer coating and a 50nrad slope error with a working distance of 37mm. In this context, there are two crucial aspects for the mechanics: one is to be able to hold the optics without degrading the shape of the mirrors; the other is to have a very precise alignment and adjustment of the opto-mechanical equipment at the beamline. I will describe the mechanical design used to achieve these two objectives, the laboratory measurements and the results obtained on the beamline.

Footnotes

Funding Agency

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Session Classification: Wednesday Poster Session

Track Classification: BEAMLINES: Optics