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Parallel kinematic mirror systems - Compensation of parasitic motions in long photon beamlines

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The horizontal offset and distribution mirror chambers (CHOMs) in the photon beam lines of the European XFEL are based on a parallel kinematic system. While these systems consist of simple and reliable mechanical components and provide very good reproducibility for mirror positioning, there always is crosstalk between all motion axes. In the long (up to 600 m) beamlines of the European XFEL, the effect of the parasitic pitch motion is very dominant.

We developed a strategy to translate the physical axes of the parallel kinematic system into virtual axes of the mirror coordinate system, and thus compensate for the parasitic motions. Application of the strategy via the XFEL software Karabo with a user interface now allows for a much more intuitive mirror alignment.

Footnotes

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