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CRISTALLINA-Q XFEL Diffractometers

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In a well-known European free-electron laser facility (SwissFEL)*, a new branch(ARAMIS 3) of the beam line delivers hard X-ray to the CRISTALLINA experimental hutch. CRISTALLINA-Q station inside, intends to investigate advanced materials focused on specific Quantum materials (QM) structures and processes. Two new heavy load dedicated Diffractometers (Dm)** have been developed. They are heavy load precision machines which, through adequate techniques and instruments, under extreme conditions (temp, press, rad), working in tandem are expected to fastly advance the investigations. The first(CrQ-Dm1) is manipulating a large-size (h=2.5m) cryo-magnet (1t, 5.2T, -10mK) and the second one(CrQ-Dm2) a smaller pulse-magnet (0.6t, 50T, 30 rate) sample instruments. They are able to perform most of the investigations in horizontal scattering, but not only. From flexibility and versatility reasons, Dm(s) have been conceived with similar configurations, having each a high level of compatibility inside & outside, however exhibiting some distinct differences. The kinematic, design, simulations and precision principles applied, together with challenging aspects and results of tests are presented.

Footnotes

* F. Nolting et al., The Swiss Light Source and SwissFEL at PSI, 2023, European Phys.. J. Plus, 136(126), 1-7

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