# The interference-monochromator

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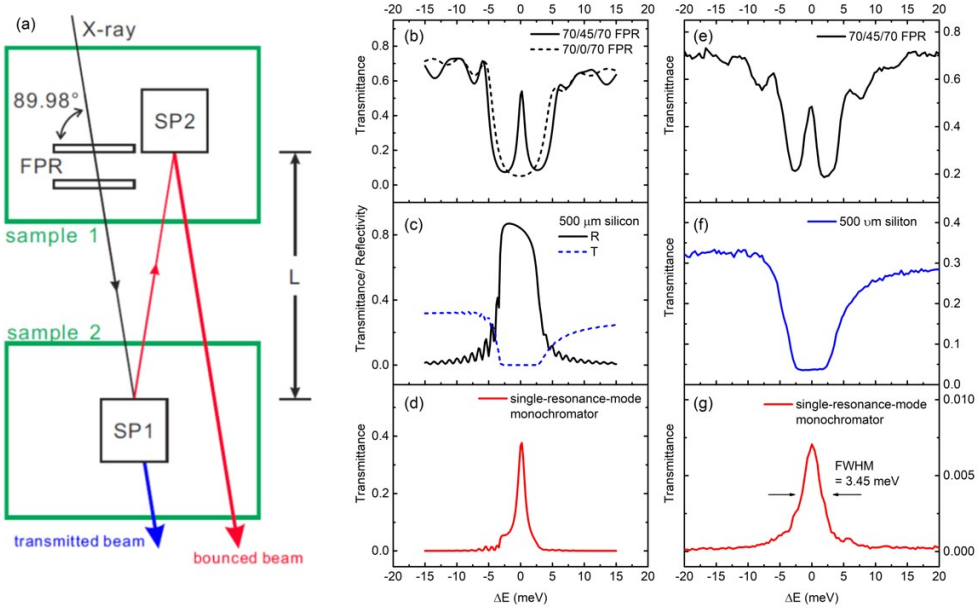
An X-rays monochromator based on the generation of interference fringes from a Fabry-Perot resonator (FPR) has been proposed and realized. The interference-monochromator (IM) combining a FPR and a double-crystal monochromator (DCM) generates single resonance peak with the energy resolution of 3.45 meV at 14.4388 keV. The energy tuning range of the IM has been observed of 2500 meV by adjusting the temperature changing of the FPR and the DCM crystals up to 70 K at room temperature. Compared with the existed high resolution monochromators, the IM is relatively compact and easy to align and operate. The most important benefits of the IM are that not only the conditions of the incident beam, such as the beamsize and the divergence, after the IM but also the diffraction geometry and the beam path during the energy tuning processes are kept unchanged. The IM is potential to be adapted in modern synchrotron beamlines and X-ray optics applications.




(a) The scheme of the IM consisting of a FPR and DCM (SP1 and SP2), the simulated spectra of (b) the FPR, (c) the SP1 or SP2 and (d) the IM and the measured results of (e) the FPR, (f) the SP1 and (g) the IM.

## References

[1] S.-L. Chang, Y. P. Stetsko, M.-T. Tang, Y.-R. Lee, W.-H. Sun, M. Yabashi, and T. Ishikawa, "X-ray resonance in crystal cavities: Realization of Fabry-Perot resonator for hard X rays," Phys. Rev. Lett. 94, 174801 (2005)