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Hybrid semitransparent beamstops for small-angle X-ray scattering instruments

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We report a novel concept of hybrid semitransparent beamstops for small-angle X-ray scattering (SAXS) instruments, removing the need for a separate photodiode to monitor the transmitted X-ray intensity. A beamstop is used to block the unscattered primary X-ray beam after it passes through the sample, protecting the detector while enabling measurement of the scattered signal. The design combines a semitransparent aluminum core with a highly absorbing steel cover to suppress parasitic scattering from the beamstop itself. The aluminum thickness is tailored to match the desired X-ray energy range, allowing sufficient transmission for beam monitoring while maintaining beam attenuation. Thanks to its modular architecture, the beamstop can be easily adapted to different beamline configurations, X-ray energies, and flux conditions.

Footnotes

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