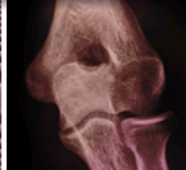
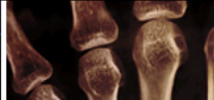




# X-Ray Optics and Instrumentation



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### Research Article

## Application of Single and Dual Multilayer Optics for Powder X-Ray Diffraction

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### Abstract

The performance of parallel beam multilayer optics, including a parabolic multilayer Osmic MaxFlux GO-13N and a flat custom multilayer, was evaluated experimentally and compared to Bragg-Brentano and traditional ' ' parallel beam' ' or ' ' thin film' ' optical geometries. A novel arrangement of a parabolic multilayer in the incident beam with a flat multilayer in the diffracted beam functioning as an analyzer crystal was proven effective for powder diffraction applications. The dual-optic configuration improves resolution while eliminating sample displacement and transparency errors as expected for a configuration with equatorial divergence below 100 arcseconds. Fundamental parameters fitting showed that the parabolic multilayer can be accurately modeled using a constant Gaussian function, while a long parallel-plate soller collimator requires a constant hat function. No additional convolutions are necessary for the diffracted-beam flat multilayer because of the lower acceptance angle.