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# P2.59: Simulation of Energy-Dispersive X-ray Spectroscopy Systems

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Energy Dispersive X-ray Spectroscopy (EDS) is a common technique in electron microscopy to identify the chemical composition of samples. The standard method for analyzing the measurement data is semi-empirical, where the necessary correction factors have been determined decades ago using detectors much less sensitive than current ones.
This work shows that the Geant4[1] and AllPix2[2] open-source simulation tools can be used to accurately model the full EDS system. This is a first step towards a complete first-principles determination of the elemental composition from measured data, precluding the need for independently determined correction factors.
The simulations are compared to Scanning Electron Microscopy (SEM) measurements for validation and differences between simulation and measurements are highlighted.

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