Monte Carlo Simulation of Electron Scattering in Solids

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The electron scattering in solids has been simulated for PMMA coated Si substrate. In this program, various materials can be chosen for e-beam resist(ER) layers and the substrate. In addition, the energy absorption profile in the ER layers with variation of the depth has been tested, and the contribution from the forward scattering is compared to that from the backward scattering. The simulation shows that the portion of the forward scattering decreases as the probe depth increases, and it is concentrated around the origin, while the backward scattering increases as the probe depth increases, and it is sparse. This result suggests possible applications such as the simulation of electron patterning of a specific geometry and the estimation of depth profile of ER, which is closely related to the process of developing.