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## Scanning low energy electron microscopy as a tool for obtaining crystallography related information from single crystal and polycrystalline metals

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Scanning low energy electron microscopy (SLEEM) is a scanning electron microscopy technique that allows using arbitrarily low electron energies while preserving a very good image resolution. Reflectivity of very low energy electrons in the range 0-30 eV correlates with the electronic structure of the material. This may be used for the determination of specimen crystallographic orientation. As the incident electron energy is changed in the 0-30 eV energy range, the image signal of reflected electrons undergoes variations. Regions of different crystallographic orientation exhibit different reflectivity behavior. This is enhanced partly also because of larger-angle contributions of the signal that are very efficiently collected by this technique. The experiments were performed on ultra-clean single crystal and polycrystalline metal specimens in ultra-high vacuum conditions. From the experiment, the function of image signal vs. incident electron energy was determined. This was further processed via advanced numerical algorithms, allowing visualization of areas with different crystallographic orientation of an arbitrary grain. The results were verified by EBSD and compared to electron optical simulations helping to elucidate the non-trivial task of signal collection.

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