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An effect of probe current on ADF image intensity of Si crystal SUHYUN KIM, Tokyo Institute of Technology, YOSHIFUMI OSHIMA, YASUMASA TANISHIRO, KUNIO TAKAYANAGI — Annular dark field (ADF) scanning transmission electron microscope has been used to identify elements in the crystal. To analyze ADF image intensity more quantitatively, simulation of ADF image is required. However, the simulation has been known to overestimate the intensity because source size used in the simulation is assumed to be a point. Therefore, finite effective source size has been taken into an account by convolving Gaussian function to simulation. And, the Gaussian convolution has been usefully used to solve the mismatch in intensity, providing us a way of quantitative analysis for ADF image. Here, we quantitatively estimated an effective size of the cold field emission source. We obtained different Gaussian convolution size for ADF image acquired with various probe current by comparing ADF image contrast between experiment and simulation. As a result, we found that the effective source size which is needed for explaining contrast of ADF image decreased with decreasing probe current.

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