3D analysis of catalytic nanoparticles on support materials
- New 3D imaging techniques by electron microscopy

Ayako Hashimoto

International Center for Young Scientists, National Institute for Materials Science

Three-dimensionally imaging (3D) at high resolution is an attractive and useful technology in material science and engineering. Recently, aberration-corrected scanning transmission electron microscopy (STEM) and confocal STEM attract attentions as 3D imaging by electron microscopy as well as computed tomography. Aberration correction allows us to use a large numerical aperture, leading to a shallow depth of field of an image. On the other hand, confocal STEM can be considered as an electron-optical version of scanning confocal optical microscopy. Both techniques can improve the depth resolution. We proposed and developed annular dark-field (ADF) confocal STEM by using a stage-scanning system and annular aperture. Then, we succeeded in the first 3D reconstruction by confocal STEM. In this presentation, I will report 3D imaging of catalytic nanoparticles on carbon support materials by confocal STEM. In particular, the comparison between confocal STEM and aberration-corrected STEM will be discussed.