東京大学グローバルCOEプログラム　機械システム・イノベーション国際拠点

東京大学 THE UNIVERSITY OF TOKYO

GMSI Global Center of Excellence for Mechanical Systems Innovation

第82回　GMSI公開セミナー

Atomic-resolution Spectrometry using Aberration-corrected STEMs in Combination with Multivariate Statistical Analysis

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日時：2011年9月29日（木）15：00−17：00

会場：東京大学工学部9号館 1F 大会議室

要旨

Chemical analysis at atomic-level with single-atom detection sensitivity is one of the ultimate goals in materials characterization. Such atomic-level characterization would be possible by electron energy-loss spectrometry (EELS) and X-ray energy dispersive spectrometry (XEDS) in the latest aberration-corrected scanning transmission electron microscopes (STEMs) because more probe current can be added into the incident probe refined by aberration-correction. Especially for EELS analysis, sufficient amounts of core-loss signals can be generated within a short acquisition time by higher current probes, and hence atomic-resolution EELS mapping has already been applied [e.g., 1-3]. For XEDS analysis, spatial resolution reaches ~ 0.4 nm [4], which implies atomic-level analysis is feasible, in aberration- corrected STEM. However, atomic-level chemical analysis is even more challenging in the XEDS approach since detection of X-ray signals is more limited than that in EELS (~100 times difference). The limited signals can be improved by applying spectrum-imaging (which records a full spectrum at individual pixels) in combination with multivariate statistical analysis [5]. In this presentation, the latest attempts to obtain atomic-level elemental distributions by EELS and XEDS approaches will be presented.

主催：　東京大学グローバルCOEプログラム「機械システム・イノベーション国際拠点」

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