



Contribution ID: 111

Type: **Contributed**

Fine Analysis of Surface Structure by using Kikuchi Envelope of Reflection High-Energy Electron Diffraction

Wednesday 20 June 2018 14:20 (20 minutes)

Fine Analysis of Surface Structure by using Kikuchi Envelope of Reflection High-Energy Electron Diffraction

Yukichi Shigeta*, Yuto Hagiwara and Morio Higuchi

*Department of Materials System Science, Yokohama City University,
22-2 Seto, Kanazawa-ku, Yokohama 236-0027, Japan
E-mail: shigeta@yokohama-cu.ac.jp*

The Kikuchi pattern, which is created by the result of inelastic scattering and dynamical diffraction of electrons, includes structural and elemental information about the surface. The Kikuchi envelope related to the surface wave resonance (SWR) is considered to include detailed information about the topmost surface. The Kikuchi pattern has been simulated based on dynamical diffraction theory [1]. It was also shown that the simulated pattern agrees with the observed pattern very well. Comparison between the simulated and observed patterns confirms that Kikuchi envelope under the SWR for the reconstructed surface shows the influence of the local surface potential formed by the adsorbate, where the surface wave propagates within the surface reconstructed layer with a thickness of 0.2 nm [1].

The intensity profile of the Kikuchi envelope is very sensitive to the surface structure. In this paper, we show that the intensity profile of the Kikuchi Envelope changes with the position of surface atom in the simulation of the Si(111) $\sqrt{3}\times\sqrt{3}$ -Ag surface structure, where the contrast of the Kikuchi Envelope shows clear change when the height of Ag layer shifts to 0.01 nm. The intensity profile of Kikuchi Envelope is very useful to determine the fine analysis of the surface structure.

[1] Yuto Hagiwara and Yukichi Shigeta, "Influence of Local Surface Potential on Kikuchi Envelope of High-Energy Electrons within a Reconstructed Surface Layer", J. Phys. Soc. Jpn. 86, 114606 (2017).

Author: SHIGETA, Yukichi (Yokohama City University)

Co-authors: Mr HAGIWARA, Yuto (Yokohama City University); Mr HIGUCHI, Morio (Yokohama City University)

Presenter: SHIGETA, Yukichi (Yokohama City University)

Session Classification: Surface Science & Applied Surface Science

Track Classification: Surface Science & Applied Surface Science