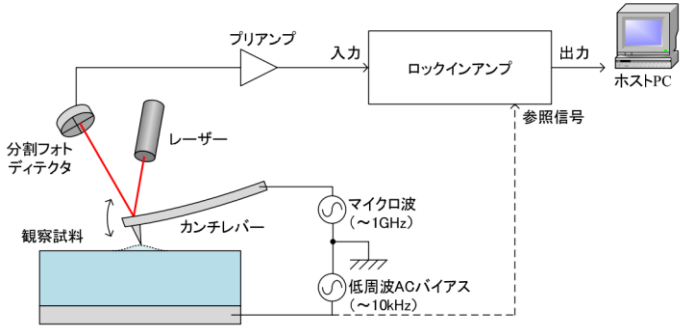
Tohoku Univ. Technology

# High Frequency-Enhanced ESM

**Enabling to evaluate low-conductivity material**




## Overview

Electrochemical strain microscopy (ESM) is known as a technique for probing ion mobility, ion conductivity, etc. in a solid material at a nanoscale. The ESM method is a method for detecting a signal of a local volume change (electrochemical distortion) of a solid generated with the movement of ions by applying a voltage, and for imaging and outputting the detected signal.

The ESM method provides an image showing the distribution of ion motion states, but the sharpness of the image depends on the ionic conductivity of the solid material. Therefore, in a solid material having a relatively low ionic conductivity, sufficient S/N ratio cannot be obtained, and it is difficult to evaluate the motion state of ions with high accuracy.

The present invention has been made in view of the above circumstances, and by applying a high-frequency bias voltage, it is possible to dramatically enhance a response signal generated in accordance with a motion state of ions.

According to the present invention, even in a material having a relatively low ionic conductivity, a distribution image can be obtained with sufficient sharpness.

## Product Application

- ESM
- SPM

## IP Data

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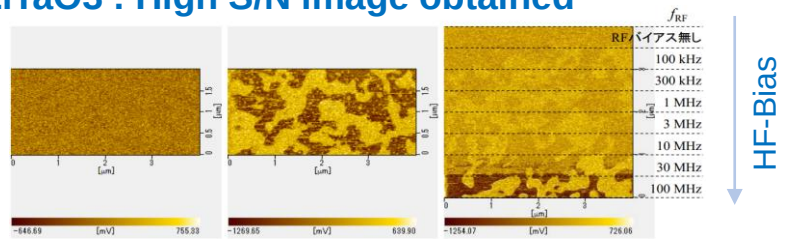
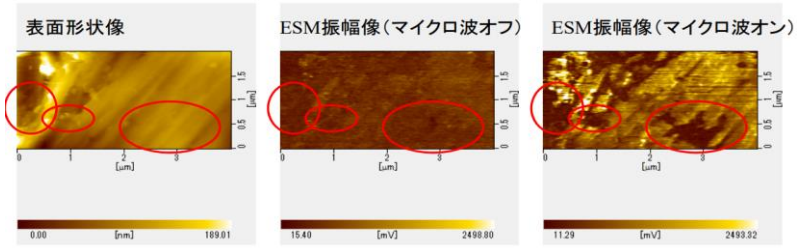
| IP No. | : | PCT/JP2020/048856 |
| Inventor | : | Yoshiomi HIRANAGA |
| Admin No. | : | T19-796 |

## Features・Outstandings

### LiTaO3 : High S/N image obtained




### LLTO : Detecting detail surface shape




## Related Works

[1] Dielectric Nano Devices Lab HP :
http://www.d-nanodev.riec.tohoku.ac.jp/english/index.html

## Contact

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