

# Estimation of structure of energy barrier generating telegraph noise by domain wall motion

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Telegraph noise is a certain type of signals that appears when jumping between adjacent energy levels due to fluctuations caused by external factors. They can be detected in semi-conductor device or magnetic domain wall

In this study, random telegraph noise generated when a magnetic domain wall in two metastable states is depinning was detected. And also, the statistical characteristics of telegraph noise according to depinning time was studied.

To detect telegraph noise, a notch structure was patterned on a Pt/Co/W sample with perpendicular magnetic anisotropy and the telegraph noise generated when the magnetic domain wall was depinning in the notch structure was obtained as a Polar MOKE signal.

As this method can provide large number of samples of depinning times compared to common methods, energy barriers of many different conditions can be obtained repeatedly to show clear linear dependencies to the field and current in certain ranges.

The extracted theoretical properties are well fitted in order range and dilute correlation related to the origin of the pinning potential can be seen in the analysis.

