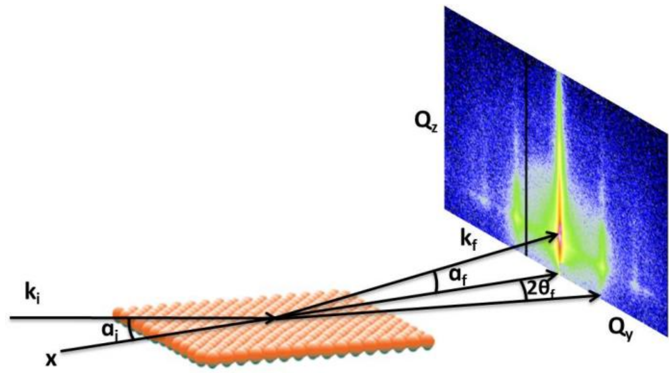
Supplementary information



FigureS1. The geometry for GISAXS experiments. The Bragg reflections are superimposed by the blurry powder rings, it results from the scattering of x-ray on the carbon tap which is in front of the 2-D detector in order to fix the hopton foil at the exit of detector tube.

The intensity of the x-ray beam detected by the 2-D detector provides information about the electron density profile of the NPs statistically averaged over the area of the illustrated sample. With $\vec{Q}$ being the scattering vector, lateral correlations are found in the Q_y direction, while out-of-plane correlations are probed in the Q_z direction. The 2-D detector hereby records the Q_y - Q_z plane. For the case of a monolayer of NPs, and hence for the case of a 2d lattice the Q_z component is degenerate and Bragg peaks appear as vertical rods in the Q_y - Q_z detector plane. Their intensity along Q_z in modulated due to the laterally averaged electron density distribution in the layer.

The stripe distance d and the lattice constant a are related according to the equation

$$d_{hk} = \frac{a}{\sqrt{\frac{4}{3}(h^2 + hk + k^2)}} = \frac{2\pi}{Q_y^{hk}}$$

Here h and k are the Miller indices and Q_y^{hk} is the position of the rods (2d-Bragg peak).

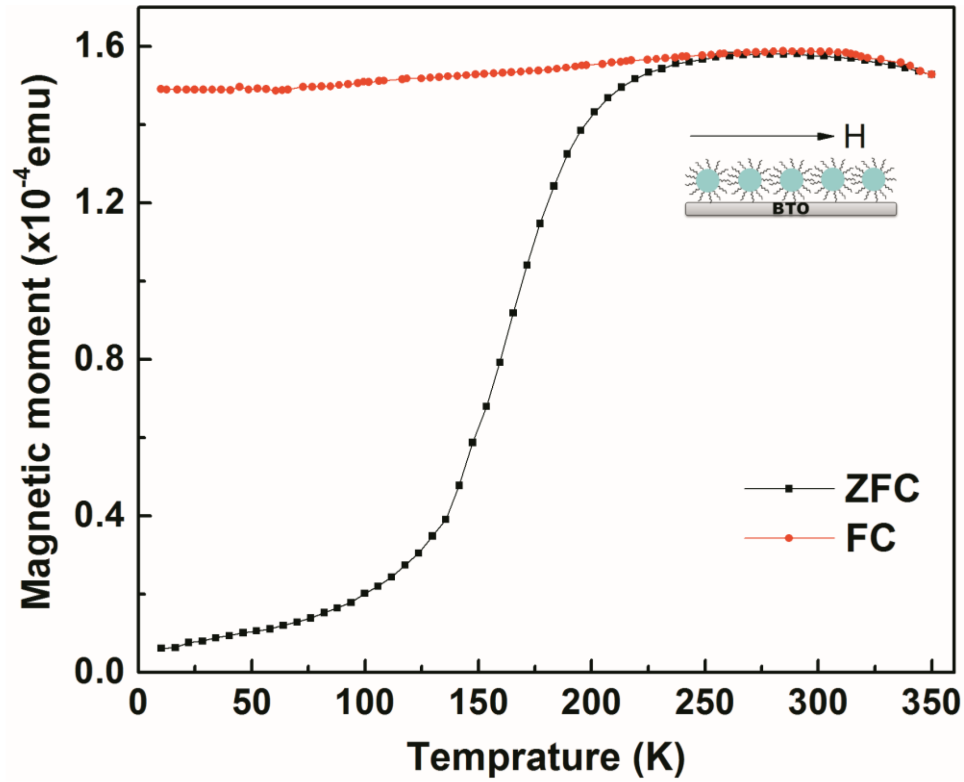


Figure S2. ZFC and FC curves of the sample BTO/NPs measured under a constant magnetic field of 5 mT.

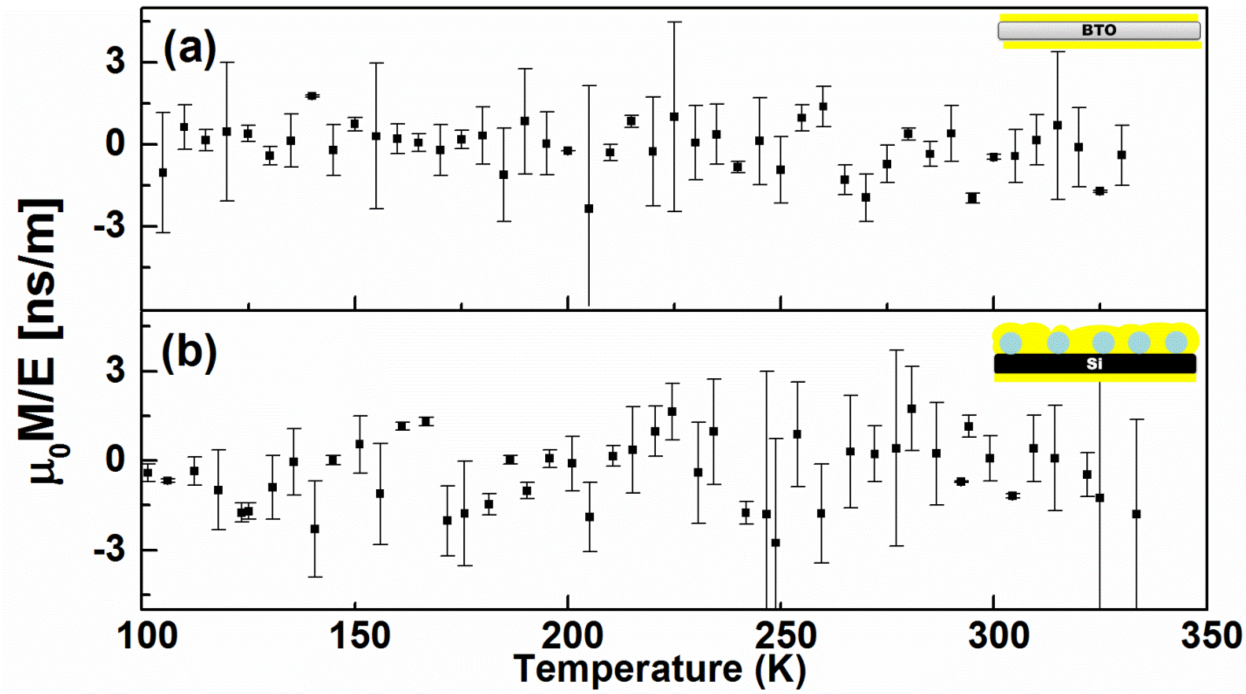


Figure S3. ME coefficient $\boldsymbol{\alpha_{ME}}$ vs. temperature measured for f =1Hz and E_{max}= 3.2kV/m at 5 mT magnetic field for (a) Au/BTO/Au and (b) Au/Si/NP/Au. Both curves show only white noise without any specific features, which rules out any ME signal from the BTO substrate alone and from the NPs alone, respectively.