Supplementary information

Figure S1. 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 $\mathbf{Q}$ 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 $\alpha_{ME}$ vs. temperature measured for $f=1$Hz and $E_{max}= 3.2$ kV/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.