Supporting Online Materials for

Exploration of Domain Sizes and Orientation Directions in Ordered Assembled Nanoparticles Assemblies with Electron Moiré Fringes

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I. Electron moiré fringes by a "misalignment": Relational expression among the moiré fringes, master grids and model grids.

Another case is that the moiré fringes are generated by a "misalignment". (**Figures S1**). If the master grid and the model grid have an angle, the moiré fringes have a larger angle (***φ***) than that (***θ***) between the master grid and the model grid. In the case (***a*** < ***a'***), the rotating direction of the moiré fringe is in the opposite direction as that of the model grids. The relationship among the moiré fringe, master grid and model grid is described by the following **Formula II**:

$$\theta = \arctan\frac{\pm\sin\phi}{(d/a)\pm\cos\phi} \quad \textbf{(II)}$$

(Where ***θ*** is the angle between the master grid and the model grid, ***φ*** is the angle between the master grid and moiré fringe, ***d*** is spacing between moiré fringes, ***a*** is the spacing between the master grid, and ***a'*** is the spacing between the model grid.)

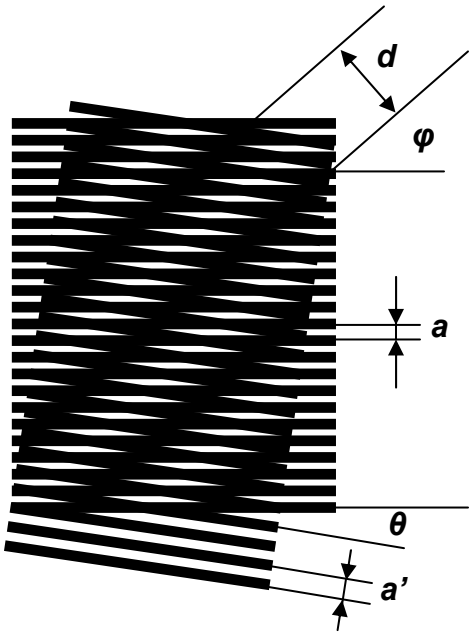


Figure S1

Reference: H. Xie, Q. Wang, S. Kishimoto, F. Dai, *J. Appl. Phys.* **2007**, 101, 103511.

II. Calculation of domain sizes in ordered assembled nanoparticles.

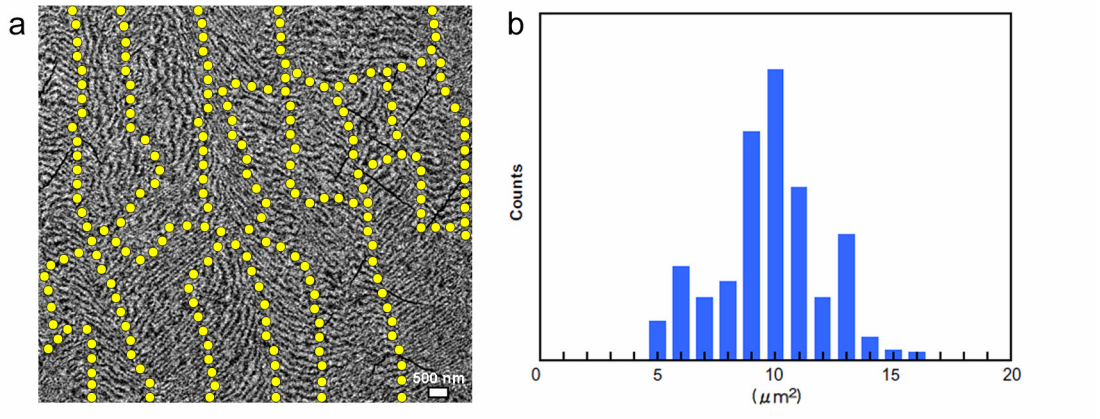
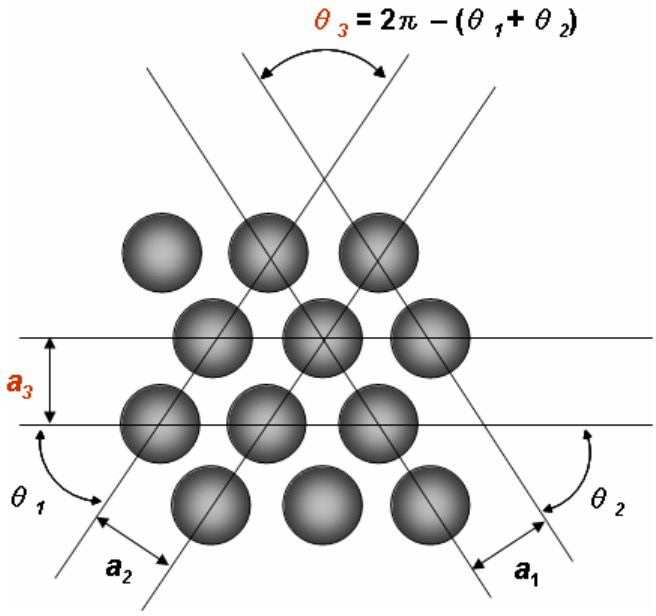


Figure S2 (a) Description of single domains in Figure 2C. In each single domain, the moiré fringes with the same spacings were oriented in the same directions. (b) Size distribution of the single domains.

III. Calculation of another spacing (a_3) of the 1D nanoparticle arrays.



$$a_3 = \frac{a_1 \ a_2}{\sqrt{a_1^{\ 2} + a_2^{\ 2} - 2a_1 a_2 \cos\theta_3}}$$

$$\theta_1 = \arctan\left(\frac{a_1 - \sin\theta_3}{a_2 - a_1\cos\theta_3}\right)$$

$$\theta_2 = \arctan\left(\frac{a_2 \sin\theta_3}{a_1 - a_2\cos\theta_3}\right)$$

Figure S3

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