SUPPORTING INFORMATION for

Mechanical coupling limits the density and quality of self-organized carbon nanotube growth

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Fig. S1. Schematic of the cold-walled reactor used to grow CNTs in this study by atmospheric pressure catalytic CVD, along with a photograph of the resistively heated platform (shown heated in air with the tube retracted).
Fig. S2. Results from the mathematical model developed by Puretzky et al.* for CNT growth from Fe nanoparticles using 0.5 sccm C$_2$H$_2$ as the hydrocarbon precursor at 1000 K. Diameter-dependent change in maximum height (A), growth rate (B), and lifetime (C).

Fig. S3. The time evolution of compressive stresses on the catalyst nanoparticles as a function of diameter, relative to the collective forest growth rate. Here, the stress is calculated by dividing the force by the projected area of a CNT considering their outer and inner diameters calculated based on fitting the SAXS linescans.
Fig. S4. The time evolution of the diameter-dependent variation in CNT number density per unit area.
**Fig. S5.** (A) Time evolution if the cumulative forest mass and total CNT number density. (B) Force per CNT from forest weight calculated by dividing the blue curve by the green curve.