## **Description of Additional Supplementary Files**

File Name: Supplementary Movie 1

Description: Change in scattering intensity for all ten patches in the plug-flow reactor. The first and second row correspond to patch 1-5 and 6-10 in Figure 2b, respectively. Color scale corresponds to scattering intensity difference compared to the first frame of the measurement,  $\Delta$ Scattering(t)=I\_xy (t)-I\_xy (t=0). Note the blinking particles during the catalytically active time period. For reference cf. Figures 5 & 6d.