Supplemental Information

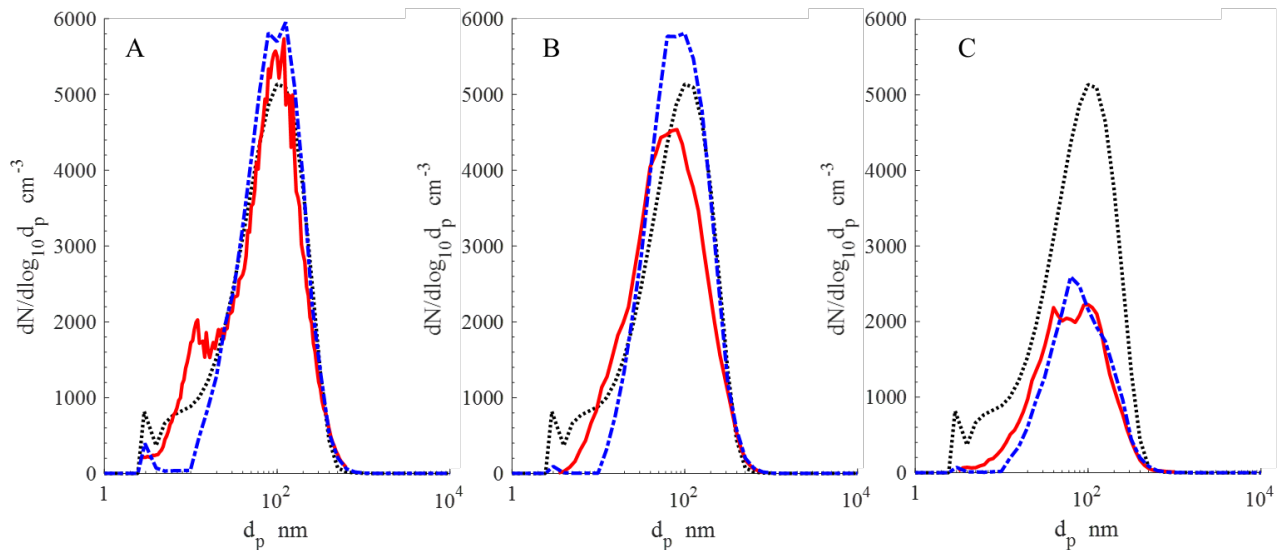



Figure SI.1. Median particle size distributions measured, originally predicted with *a priori* rates in TOMAS, and estimated with the inverse model are shown in the dotted red, solid black, and dashed blue profiles, respectively. Results are shown using measurements at (a) San Pietro Capofiume, (b) Melpitz, and (c) Hyytiälä.

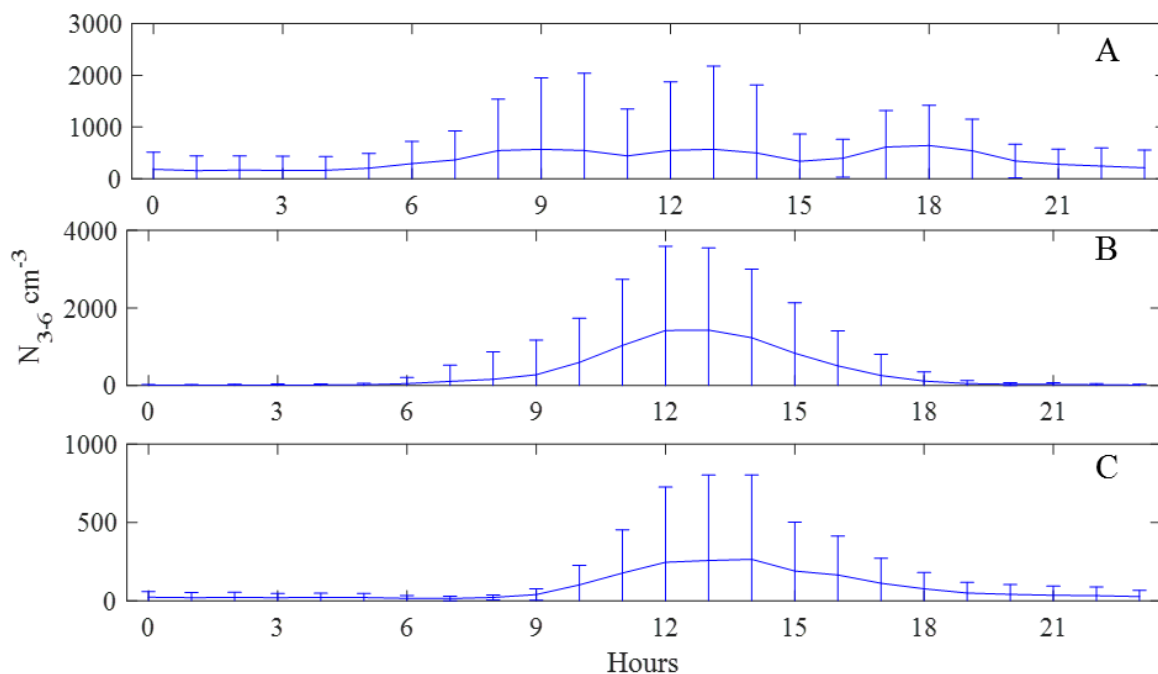
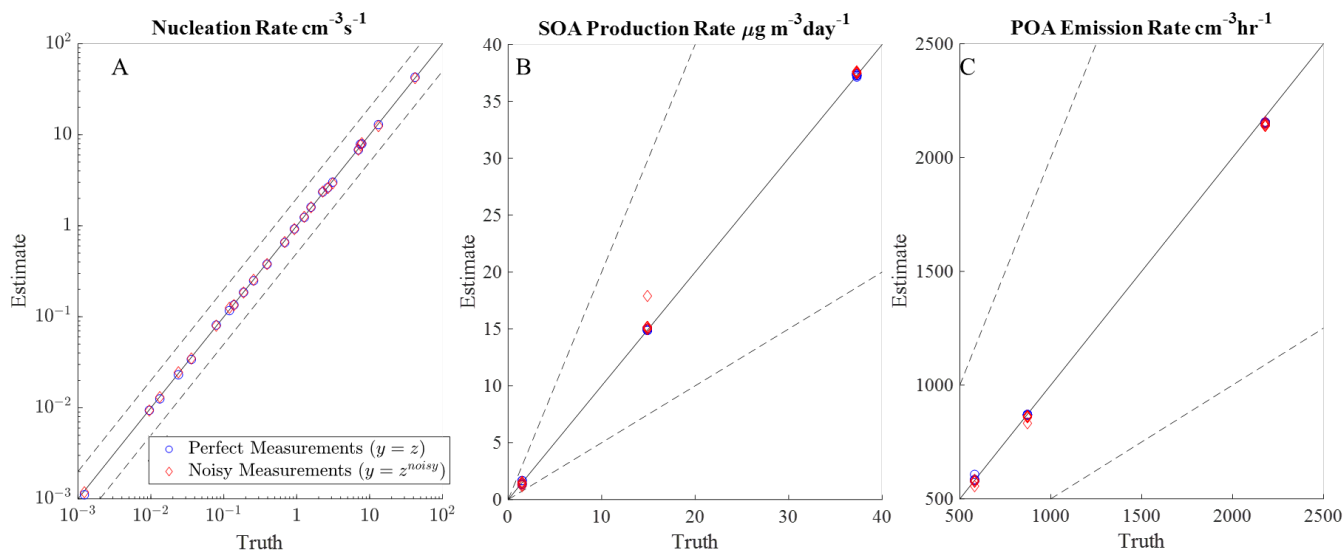



Figure SI.2. Average diurnal profiles of measured N_{3-6} during stagnant events at (a) San Pietro Capofiume, (b) Melpitz, (c) Hyytiälä.

5   **Figure SI.3. Scatter plots of time-averaged estimated process rates in the cases with perfect and noisy measurements shown as blue circles and red diamonds, respectively.**