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Development and characterization of a high-performance single-particle aerosol mass spectrometer (HP-SPAMS)

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Figure S1. Theoretical transmission curves for simulation and analysis of aerodynamic lenses. As can be seen from the figure, the theoretical transmission efficiency of the new lens is higher than 70% in the 100 nm-5 μm particle size range and 90% in the 100 nm-8000 nm particle size range

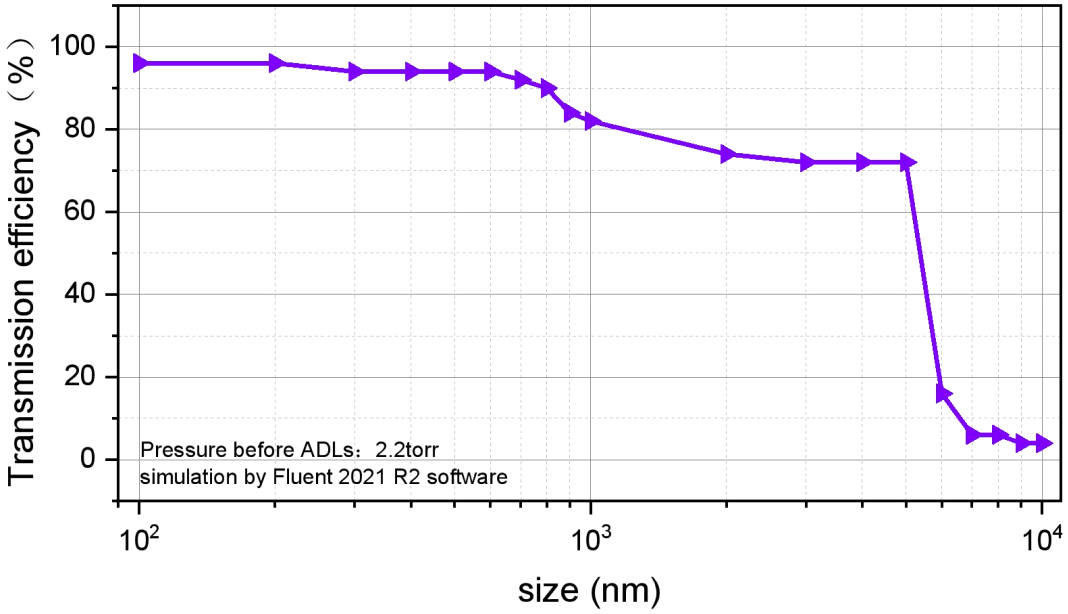

Figure S2. Experimentally measured time-of-flight of 150nm-5400nm PSLs particles between two sizing lasers. This shows that HP-SPAMS can analyze particles in the 150nm-5400nm range.

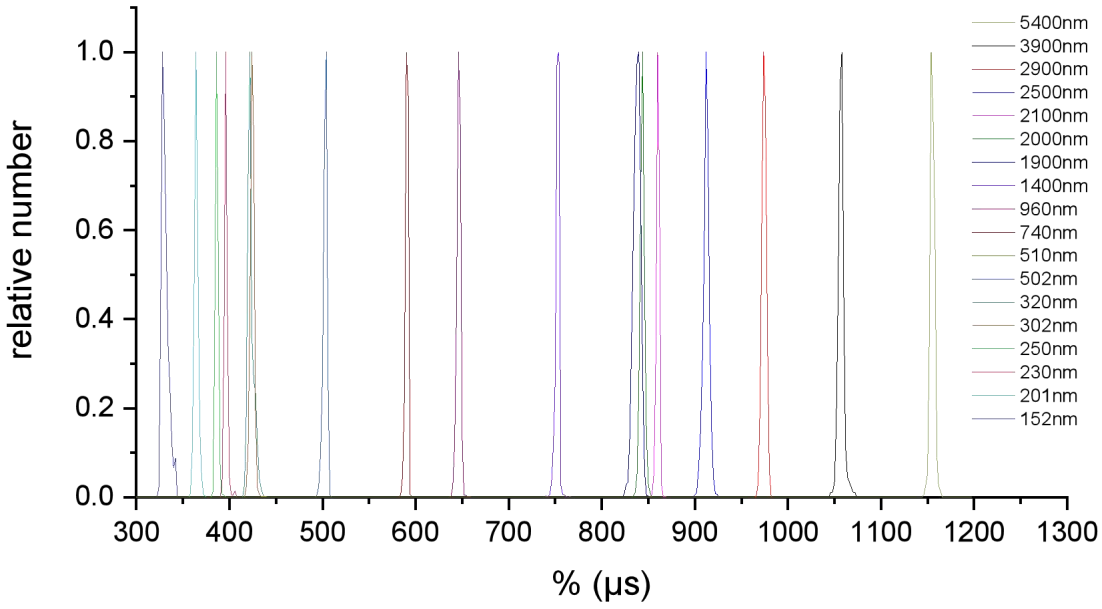

Figure S3. Comparison of PMT response signal noise with and without low-pass filter (1.9 MHz). As can be seen from the figure, the background noise level has changed from -9.8±6.4mV to -10±0.8mV, which indicates that the low-pass filtering reduces the influence of stray light.

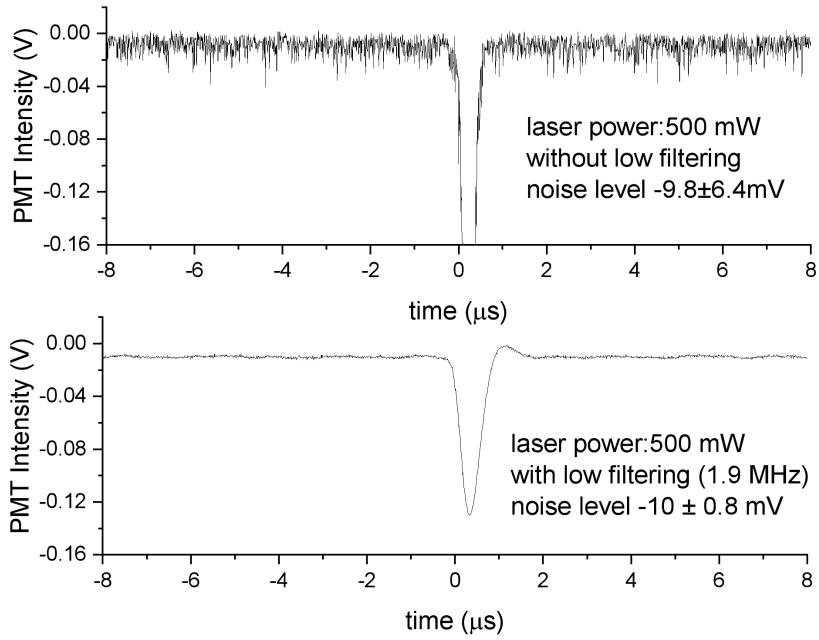

Figure S4. Temporal variation of the number of size particles and hit particles detected by HP-SPAMS with $PM_{2.5}$ concentration.