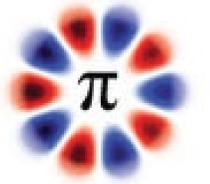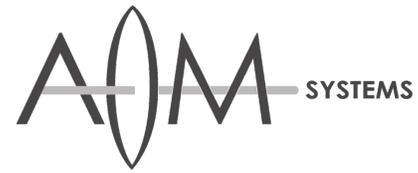# Particle characterization by analyzing light scattering signals with a machine learning approach

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In this study, we employ a machine learning approach to analyze single light scattering signal for determining the size (d) and velocity (v) of individual particles in a spray. To generate the machine learning model, we obtained light scattering signals with calculated values of d and v from a classical measurement device based on the TSTOF technique, which utilizes four signals.
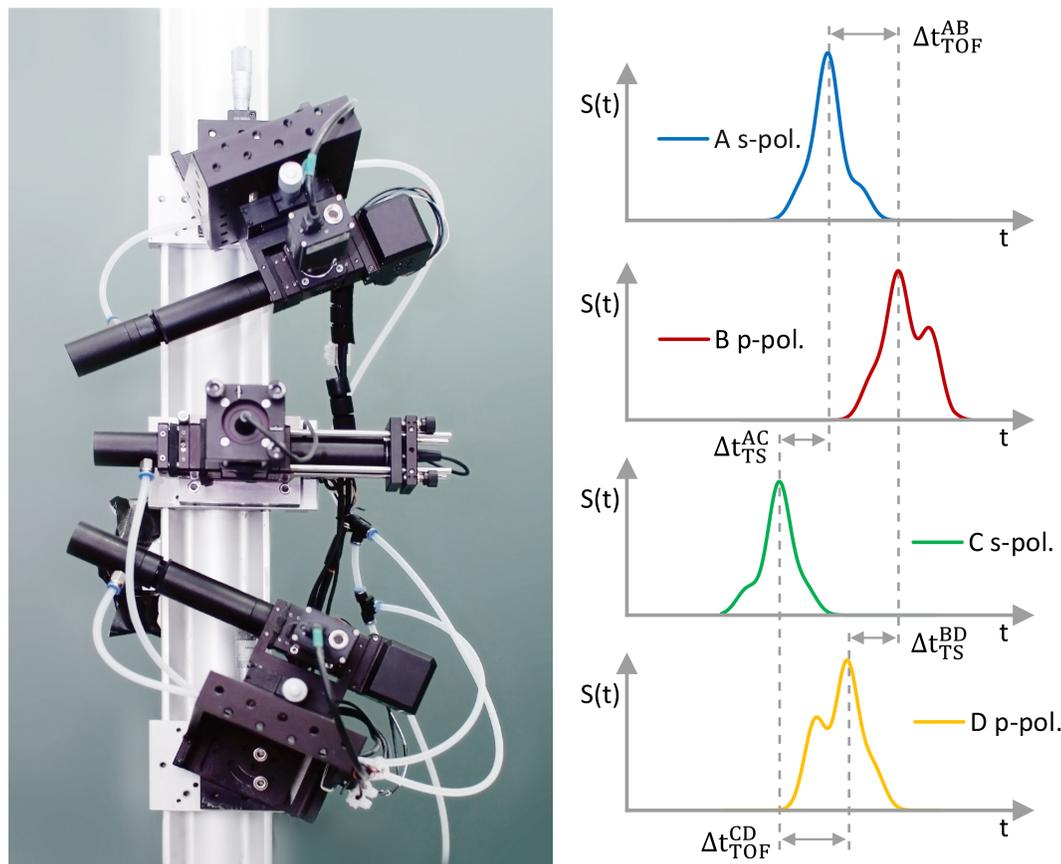
We trained the machine learning model using the four signals but connected only a single signal to the model in the final step. Initial experimental results have been conducted, and preliminary calculations demonstrate high potential for this method.

$$S_A(t) = \sum_p^{\{0,1,2,3\}} S_p^{(A)} \exp\left\{-\frac{-2\left(t - t_p^{(A)}\right)^2}{\sigma^2}\right\}$$

$$S(t) = \{S_0, \ldots, S_N\} \rightarrow \{d, v\}$$

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