The growth of nanoparticles and the dynamics of nanodust clouds in an argon-acetylene-plasma can be investigated using the Imaging Mie (I-Mie) technique [1]. It is a simple setup with two CCD cameras to gain online spatiotemporal resolved information about the particle size during the growth process. However, to determine the size of the nanodust, the degree of polarisation (DoP) is needed, which is not provided by I-Mie measurement itself.

As an improvement of the Imaging Mie ellipsometry, a new setup is developed, which is an enhancement of the conventional rotating compensator ellipsometer (RCE) setup using a beam expander and a CCD camera. This allows to gain the full 2D information and has the capability to estimate the size parameter $x = \frac{2\pi r}{\lambda}$, the complex refractive index $N$ and the DoP simultaneously at every point in a 2D plane.

For such an imaging diagnostic, it is essential, that $\Psi(\Delta)$-plots (one is shown in Fig. 1) are automatically analysed to get $x$, $N$ and DoP for every position. The situation becomes even more complicated when double scattering processes have to be taken into account.

We present an analysis of data taken from a radio frequency driven parallel plate discharge. Nanoparticles are produced in an argon acetylene plasma, forming large clouds. The density and the size distribution of the particles can be controlled by external parameters like acetylene concentration or rf power.

This work was funded by the SFB-TR24 Greifswald-Kiel, Project A2.

References