Contact angle measurement and statistical contact angle analyses

Michael Schmitt[1*], Florian Heib[1]

[1]*Physical Chemistry, Saarland University, Saarbrücken, Germany*

**mic.schmitt@email.de*

For everyone dealing with wetting and adhesion the following question is of fundamental importance. "What is the most approximate to measure contact angle?"[1]

We split this question in the measuring of drop contours (→ CA's) and the analysis of measured CA's. We were able to develop reasonable answers for the question even for our "dynamic" sessile drop experiments resulting in strongly non-axisymmetric droplets. Therefore drop contour analysis was performed using HPDSA.[2]

The developed three procedures namely, overall, global and individual statistical analyses[3][4] will be briefly introduced within this contribution. These statistical procedures analyze the drop motion behavior and lead e.g. to advancing and receding angles (specific angles) which are not liable to subjectivity and allow the surface properties to be described/analyzed much more in detail. The presented three statistical analysis procedures are particularly suitable if a huge number of images have to be analyzed (e.g. by using a high speed camera).

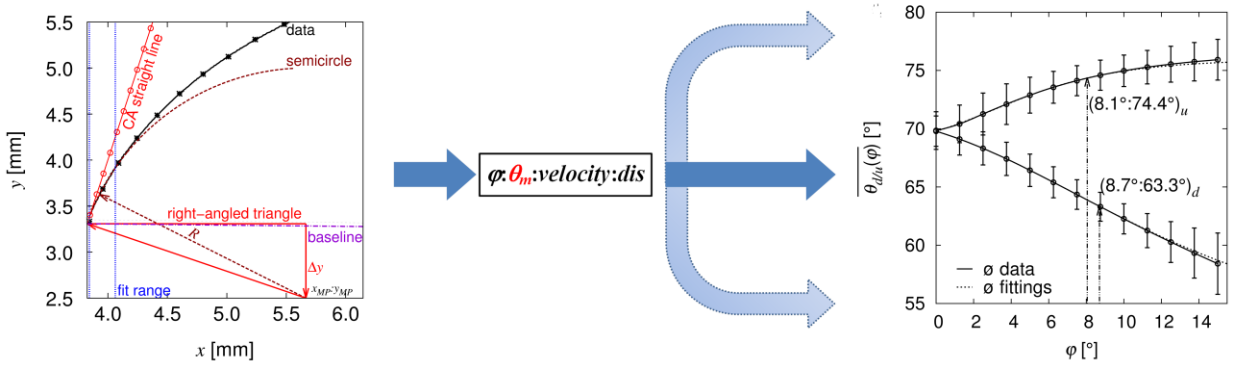

Figure 1 Schematic demonstration of the HPDSA and of the overall statistical CA analysis.[4]

[1] K. Mittal, *Contact Angle, Wettability and Adhesion*, volume 6, 2009, Leiden, Boston, USA.

[2] M. Schmitt, F. Heib, *J. Chem. Phys. High-precision drop shape analysis on inclining flat surfaces: Introduction and comparison of this special method with commercial contact angle analysis*, 2013, **139**, 134201.

[3] M. Schmitt, J. Grub, F. Heib, *J. Colloid Interface Sci. Statistical Contact Angle Analyses; "slow moving" drops on a horizontal silicon-oxide surface,* 2015, **447**, 248.

[4] M. Schmitt, K. Groß, J. Grub, F. Heib, *J. Colloid Interface Sci. Detailed Statistical Contact Angle Analyses; "slow moving" drops on inclining silicon-oxide surface,* 2015, **447**, 229.