

Contents

1. Introduction	4
2. Measurements of the Surface Tension and Contact Angle	8
2.1. Review of Selected Solutions.....	9
2.2. Sessile Drop Method.....	10
3. THERMO-WET Measurement System	14
3.1. Construction of the Measurement System	15
3.2. Software of the Measurement System.....	16
3.2.1. Project Specification.....	17
3.2.2. Modular Structure.....	18
3.2.3. Serial Communication	19
3.2.4. Task Experiment Scheduler Module.....	23
4. Image Enhancement.....	25
4.1. Removal of Instrumental Background	26
4.2. Compensation of Pixel Non-uniform Response.....	28
4.3. Automatic Change of Optical Filters.....	29
4.4. Switching Median Filter.....	35
5. Correction of the Image Distortions Influenced by the Gas Flow.....	46
5.1. Correction of the “Gas lens” Effects.....	49
5.2. Aura Removal.....	54
6. Segmentation	57
6.1. Algorithm for Fast Specimen Localization.....	57
6.2. Edge Detection with Dynamic Selection of Filtration Masks.....	59
6.3. Contour Tracing.....	61
6.4. Profile Correction at the Contact Point of the Three Phases	62
6.5. Subpixel Edge Detection.....	66
7. Conclusions.....	72
Bibliography.....	75