

## MODELING OF CRITICAL CONDITIONS FOR DROPLET BREAKUP

### *MODELLIERUNG DER KRITISCHEN BEDINGUNGEN FÜR DEN TRÖPFCHENZERFALL*

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### **Abstract**

A simple mathematical model of liquid droplet deformation in a gas flow is proposed. The model is based on two governing equations, namely, equation of droplet deformation and equation of droplet motion. The former is formulated in terms of DDD — approximation ('Dominant Direction of Deformation') with due regard for viscous liquid circulation inside a droplet. The latter is based on a standard equation of motion with a properly chosen aerodynamic drag coefficient. Criteria for critical droplet deformation followed by breakup process have been introduced on the basis of semi-empirical considerations. The model has been validated by comprehensive comparisons between predicted results and available experimental data on droplet deformation and breakup behind shock waves.