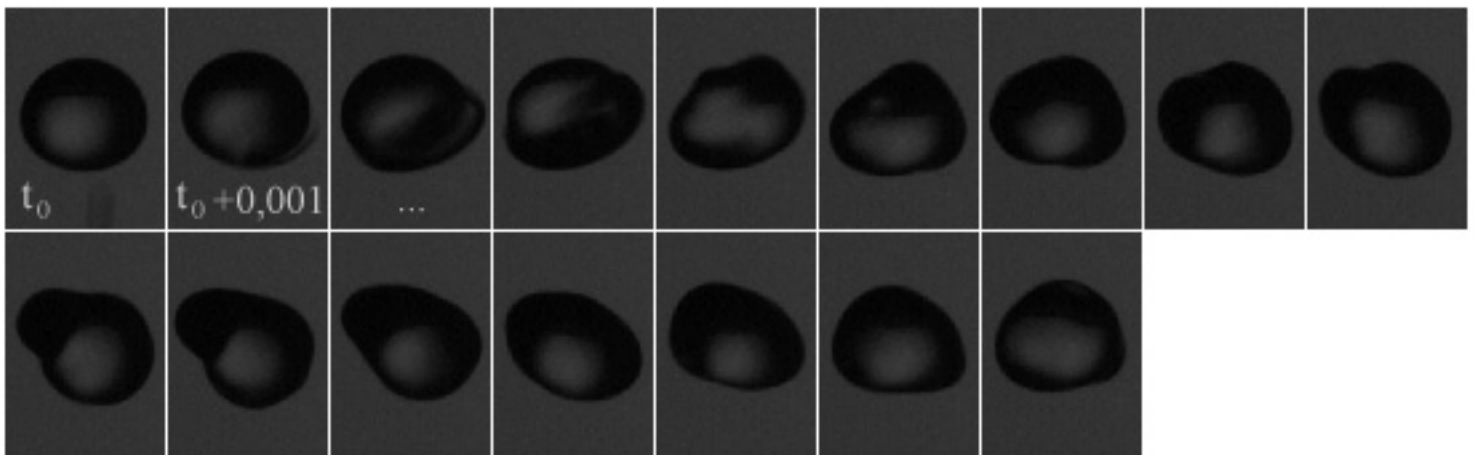


Effects of Collision Processes on the Shape and Oscillation of Raindrops

Simon Kessler
Johannes Gutenberg Universität Mainz



Images of a small drop (0.5 mm diameter) colliding with a larger one (2.5 mm diameter). The camera took a picture every 0.001 seconds.

Raindrop shape is important for rain rate determination using a weather radar. The shape of a single raindrop suspended in air is analyzed quite well, both experimentally and theoretically. However, in clouds or rainfall different drops can collide. The collision affects drop shape and, hence, has an effect on the backscattered radar signal.

The goal of the presented diploma thesis was to quantify the effects of collision on raindrop shape experimentally. The experiments were carried out in the Mainz Vertical Wind Tunnel, where videos of different collisions were filmed with a high speed camera. An image

processing program was used to specify the values of several characteristics used to describe raindrop shape.

Afterwards these characteristics were compared for drops before and after collision.

