# Surface Tension and Viscosity Measurements by the Oscillating Drop Method on Board Parabolic Flights

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The viscosity and surface tension are two important thermophysical properties needed for casting simulations of industrial metallic alloys. Because of their high chemical reactivity these properties are difficult to measure by classical methods. This holds in particular for the high melting point Ti-alloys. Containerless processing in an electromagnetic (em)-levitation device offers an alternative approach for non-contact thermophysical property measurement. Measurement of the viscosity by the oscillating drop method is, however, not possible under normal gravity (1-g) conditions because of the turbulent fluid flow associated with em-levitation under 1-g conditions. Parabolic flights with typically twenty seconds of reduced gravity provide a readily accessible platform for viscosity measurements under reduced gravity conditions. Within the ThermoLab ESA MAP project parabolic flights have been extensively used for viscosity and surface tension measurements by the oscillating drop method of industrial alloys with an eml device. Here, we report on some systematic aspects of these measurements such as the processing in parabolic flights, progress in data acquisition and analysis, the effect of sample rotation and precession on the damping time constant measurements, and the dependence of the measured damping time constant on process parameters such as the amplitude of the surface oscillation excitation pulse. Results of a recent calibration experiment with PdSi will be discussed.