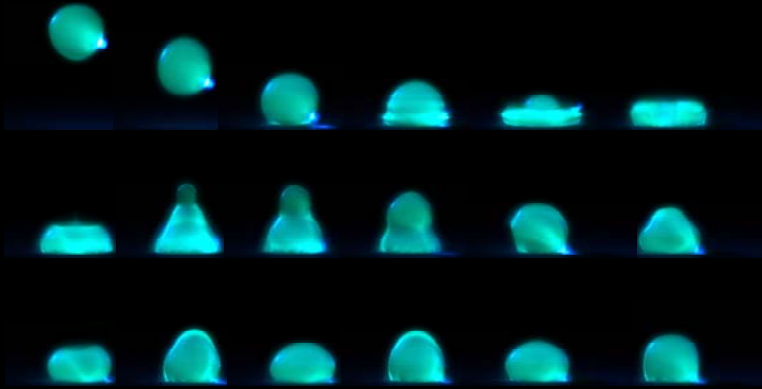


Luminescent Technique for Temperature Characterization of Supercooled Water



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2mm

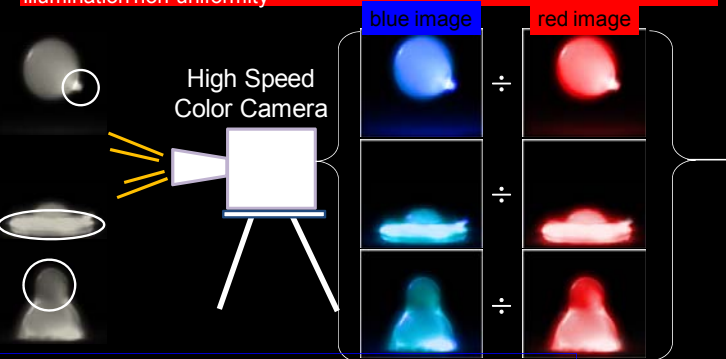
Dual Luminescent Imaging

We applied dual-luminescent technique to characterize the temperature distribution of the supercooled water.



- luminescence increase/decrease by
- temperature, T
 - optically thick
 - illumination non-uniformity

temperature-dependent luminescence
temperature-independent luminescence



$(T\text{-dependent luminescence}) \cdot (T\text{-independent luminescence})$

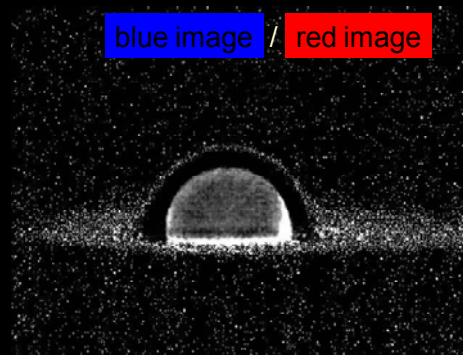
$(T\text{-independent luminescence})$

Imaging Results

Raw Luminescent Image



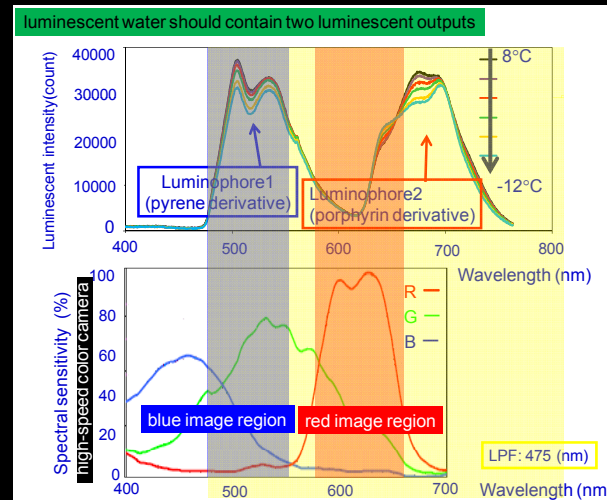
blue image / red image



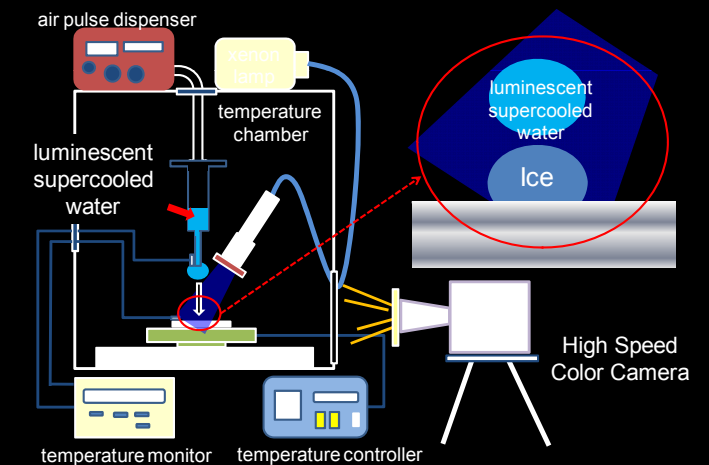
Temperature

higher

lower



Temperature Measurement Setup



- droplet diameter: ~ 2 mm
- images captured at 100 frames/s (~20 s video shown: FAST MOTION)

icing process was captured
supercooled droplet \rightarrow 0 °C droplet
another calibration for ice temperature will be necessary