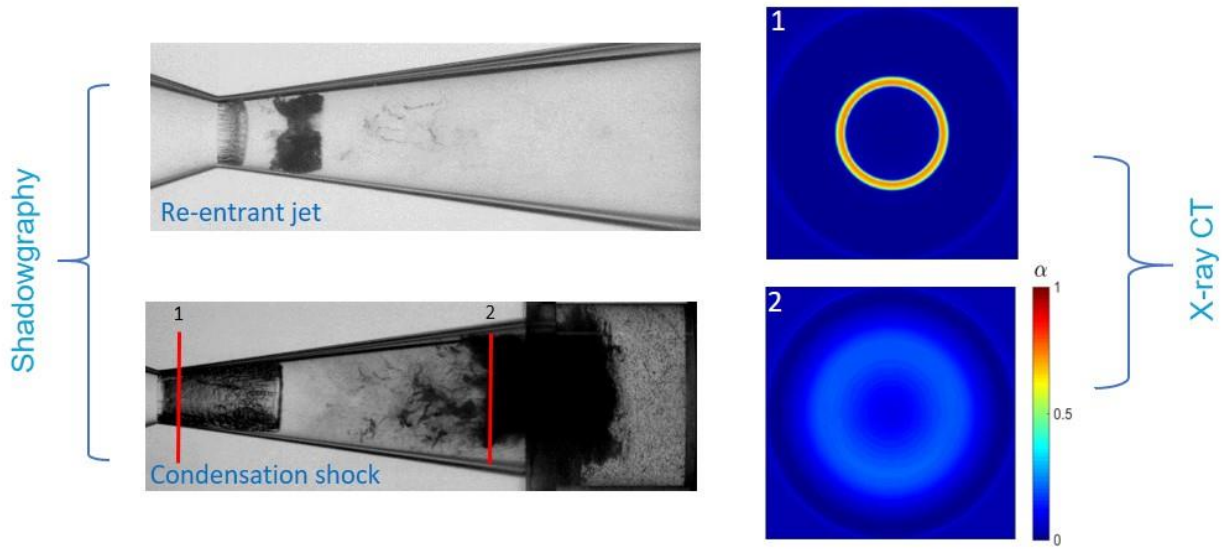
Summary of deliverable D2.3: Complete set of measurements for converging-diverging nozzle (venturi)

provided by ESR 5, Saad Jahangir, under the guidance of Prof. Christian Poelma, Delft University of Technology, August 2018



(Left) Two high-speed snapshots showing re-entrant jet and condensation shock in a venturi. (Right) Quantitative X-ray CT measurements of vapor fractions at two different locations along the venturi are shown.

Cloud cavitation is the most interesting and complex regime in cavitation study, because different mechanisms cause the shedding of vapor clouds. The analysis of these mechanisms may result in the correct understanding of the negative effects of cavitation, occurring in a wide variety of applications. In this deliverable, partial cavitation regimes in an axisymmetric converging-diverging nozzle are investigated experimentally. The modern state of the art techniques such as shadowgraphy and X-ray computed tomography are utilized on a portable test-rig. Using such techniques, we are able to unveil the hidden flow features which affect the cavitation dynamics. This particular problem and test geometry have not been studied experimentally in detail so far. The present study quantifies the findings of the experiments, capturing re-entrant jet mechanism, bubbly shock structures, vapor fractions and shock wave velocities.