

2001 – 2002 Oregon State University Microgravity Flight Team
Bubble Coalescence in Microgravity

Abstract

The Unus Boule (° one bubble (lat.)) experiment proposed by the Oregon State University Microgravity Flight Team 2002 is designed to visually record the range of velocities and sizes under which bubbles coalesce in microgravity. This experimental investigation into the properties of bubble coalescence is problematic to complete successfully under standard gravitational conditions and would therefore generate the most useful data in the microgravity environment onboard the KC-135. Determining the velocities and diameters under which bubbles are most likely to coalesce would allow much more precise modeling of two-phase and two-fluid flow. Fluid flow velocities could be calculated to aid either disintegration or coalescence of bubbles depending on the scientific or industrial application.

The Unus Boule (UB) team intends to engineer, construct, and test a Bubble Injection Bay (BIB) in which bubbles of varying diameter and velocity will be impacted to force coalescence or non-coalescence. Visual data will be recorded with a standard VHS camcorder and analyzed at the Oregon State University Advanced Thermal Hydraulics Research Laboratory (ATHRL) using MATLAB image processing software. The analyzed data and resulting report will be communicated to academic and professional communities. The OSU-UB team will also complete an extensive outreach program aimed at interesting young people in space science and the Reduced Gravity Student Flight Opportunities program, and communicating information of scientific value.

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