Abstract Submitted
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Experimental Investigation of Shock Wave Surfing N.J. PARZIALE, H.G. HORNUNG, J.E. SHEPHERD, California Institute of Technology, S.J. LAURENCE, DLR — Shock wave surfing is investigated experimentally in GALCIT's Mach 4.0 Ludwieg Tube. Shock wave surfing occurs when a secondary free-body follows the bow shock formed by a primary free-body; an example of shock wave surfing occurs during meteorite breakup. The free-bodies in the current investigation are nylon spheres. During each run in the Ludwieg tube a high speed camera is used to capture a series of schlieren images; edge tracking software is used to measure the position of each sphere. Velocity and acceleration are had from processing the position data. The radius ratio and initial orientation of the two spheres are varied in the test matrix. The variation of sphere radius ratio and initial angle between the centers of gravity are shown to have a significant effect on the dynamics of the system.

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