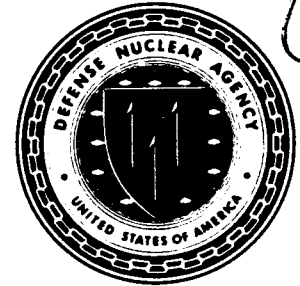


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Properties of Actual and Numerical Shock and Blast-Wave Phenomena

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Technical Report

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13. ABSTRACT (Maximum 200 words) During the last four years almost all of the 10 tasks set out in our original proposal, and more, were completed and resulted in many publications in the open literature and in UTIAS Reports, Technical Notes and Reviews. The original problems will be listed for reference and the resulting publications are given.				
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SECTION 1

PROBLEMS

Problem 1

Radiation-Induced Boundary Layers — This problem was not initiated since it was done full scale in the field using helium layers and in the Ernst Mach Institute, also using helium layers, to simulate the radiation-induced boundary-layers. It would be useful to use hydrogen to simulate the heated boundary layer, if practical.

Problem 2

Dusty-Gas Boundary Layers Induced by Shock Waves — This problem was completed and resulted in 3 UTIAS Reports by B. Y. Wang and I. I. Glass, as well as a paper in the Journal of Fluid Mechanics.

Problem 3

Pitot Tubes in Dusty Flows — Very good data has already been obtained by Mr. G. D. Lock, as part of his Ph.D. thesis, under the direction of Dr. J. J. Gottlieb. His research should be completed in 1989. It will provide the first credible quantitative data on normal shock-wave structure in dusty air.

Problem 4

Passage of a Shock Wave Through a Dusty-Gas Layer — The analytical work was completed by H. Miura and I. I. Glass, and is reported in Proc. R. Soc. Lond. A385, 85-105, 1983.

Problem 5

Normal Shock-Wave Reflections in a Dusty Gas — The analytical work was completed by H. Miura, T. Saito and I. I. Glass, and is reported in Proc. R. Soc. Lond. A404, 55-67, 1986. An additional analysis was done by J. J. Gottlieb and C. E. Coskunes, "Effects of Particle Volume on the Structure of a Partly Dispersed Normal Shock Wave in a Dusty Gas", UTIAS Report NO. 295, 1985.

Problem 6

Collision of Oblique-Shock-Wave Reflections with a 90° Ramp in Air and CO₂. This work was completed and published as UTIAS Report No. 290 by J. C. Li and I. I. Glass under the same title. It was also presented at the 15th International Symposium on Shock Waves and Tubes, Stanford, California, 1986, and also as "Interaction of Oblique-Shock-Wave Reflections in Air and CO₂ with Downstream Obstacles", by H. M. Glaz, I. I. Glass, J. C. Li and P. A. Walter, at the 15th International Symposium on Shock Waves and Shock Tubes, Stanford, California, 1986.

Problem 7

Boundary-Layer Growth Along a Wedge and Its Effects on the von Neumann Paradox — This work was completed and published as "Pseudo-Stationary Oblique-Shock-Wave Reflections in Low- γ Gases - Isobutane and Sulfurhexafluoride", UTIAS Technical Note No. 267, by J. T. Urbanowicz.

Problem 8

A Resolution of the 'von Neumann' Paradox — This work was completed and presented at the 8th International Mach Reflection Symposium, UTIAS, July 12-15, 1988, under the same title by J. T. Urbanowicz and I. I. Glass, and presented by Mr. Urbanowicz.

Problem 9

Regions and Transition Boundaries in Air and SF₆ — This work was completed and has appeared in several publications.

SECTION 2

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