Title

CRATERING MODEL VERIFICATION: A CENTRIFUGE PREDICTION VERSUS FIELD RESULT FOR A 40-TON EXPLOSIVE EVENT [abstract]

Authors

Holsapple, K.A.
Schmidt, R.M.

Publication Date

1984-07-18

Peer reviewed

Proceedings of the

SYMPOSIUM ON RECENT ADVANCES IN GEOTECHNICAL CENTRIFUGE MODELING

A symposium on Recent Advances in Geotechnical Centrifuge Modeling was held on July 18-20, 1984 at the University of California at Davis. The symposium was sponsored by the National Science Foundation's Geotechnical Engineering Program and the Center for Geotechnical Modeling at the University of California at Davis.

The symposium offered an opportunity for a meeting of the International Committee on Centrifuges of the International Society for Soil Mechanics and Foundation Engineering. The U.S. participants also met to discuss the advancement of the centrifuge modeling technique in the U.S. A request is being transmitted to the American Society of Civil Engineers to establish a subcommittee on centrifuges within the Geotechnical Engineering Division.

SYMPOSIUM ON RECENT ADVANCES IN GEOTECHNICAL MODELING
University of California at Davis, 19-20 July 1984

CRATERING MODEL VERIFICATION: A CENTRIFUGE PREDICTION VERSUS FIELD RESULT FOR A 40-TON EXPLOSIVE EVENT.

K. A. Holsapple - University of Washington FS-10, Seattle, WA 98195
R. M. Schmidt - Boeing Aerospace Co., MS 13-20, Seattle, WA 98124

The centrifuge has proved to be a powerful tool in the study of the mechanics of explosive and impact cratering. Over the past several years, centrifuge parametric studies in a variety of materials have resulted in a new understanding of the proper scaling for the phenomena,[1,2,3,4] and have resulted in new interpretations of the relatively few existing full-scale events. In addition, a few "after-the-fact" simulations of previous full-scale field events provided validation of the sub-scale technique.[5,6,7,8]

Recently, an important verification of the technique was accomplished. A centrifuge experiment at 1/200 linear scale of a complex 40-ton explosive field event was performed "before-the-fact" as a prediction of the result of that full-scale event. This example furnished a rare opportunity for a comparison of a full-scale event with a centrifuge result.

A description of that experiment and the results will be presented. The design of the experiment at this small scale required a number of compromises be made in the model. The rationale for these compromises will be presented.

The results were very gratifying. In contrast to the "state-of-the-art" numerical prediction, which proved to be in error by over 100% in volume of the crater, the single-shot centrifuge prediction was accurate to within 12%. Subsequent refinement of the model gave even better accuracy.

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