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## **EXPERIMENTAL AND NUMERICAL INVESTIGATION OF SOIL COMPACTION DUE TO PRESSURE PULSE LOADING**

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An investigation of the mechanical behaviour of soil material under pressure pulse loading has been conducted. In a first phase dry sand was used as sample material in order to eliminate the influence of humidity.

The first part of the presentation deals with an experimental investigation of cylindrical sand samples of three different lengths in a shock tube where pressure pulses were applied at two different levels. In these experiments the sand compaction at several positions along the samples has been measured. This was accomplished by means of piezo-electric accelerometers embedded in the sand. Sand pressure measurements have been carried out at the back end and along the surface of the samples. For these measurements the piezoelectric pressure transducers had to be modified to improve the contact with the sand, considering the grain size.

In the second part the results of a numerical simulation of the shock tube experiments using the AUTODYN-2D computer code are presented. The input data needed for the AUTODYN soil material models were derived from previously performed material tests. The compaction curve is based on the results of 1-D compression tests up to 260 MPa. The material strength values were derived from tri-axial compaction/shear tests.

In the third part the numerical results from the AUTODYN simulations are compared with those from the experiments. The numerical compaction values in terms of displacement are in good agreement with the experimental results. The comparison of the pressure results, however, is still disappointing. Further investigations are necessary to clarify this point.