

# **P04 Simulations of the Response of Concrete Structures Subjected to Air Blasts**

**Svantesson, P**

## **Abstract:**

It is often of vital interest to have knowledge and tools to assess the damage to buildings subjected to the effects from an explosion. The ability to perform assessments can be used for analysis and development of possible countermeasures for any kind of scenario including explosive events. During such work, it is valuable to be able to perform parameter variations relatively easy to create a broad understanding of the vital physical phenomena involved. Detailed finite element modelling and simulations of large building structures with many interacting components are often time consuming and computationally expensive. It is therefore necessary to simplify the model to make it more computationally efficient, but at the same time ensure accuracy and fidelity sufficient for the problem at hand. Work to find a simple yet effective model to determine the dynamic response of reinforced concrete structures subjected to air blasts was therefore initiated. A concrete slab model built-up by one layer of shell elements with smeared reinforcement was made. The distribution of the blast load was calculated with simplified methods, but with consideration of both positive and negative blast pressure phases. Simulations were compared to previously performed experiments on simply-supported slabs and a part of a multi-story building in 1:4 scale. The results of the simulations will be presented and comparisons with experiments will be made.

## **Notes:**