

EFFECT OF HUMAN AND SHEEP LUNG ORIENTAION ON PRIMARY BLAST INJURY INDUCED BY SIMPLE BLAST

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ABSTRACT

The intensity and type of trauma inflicted on a body by a blast overpressure are related to many factors. Among them, there is body orientation. In order to study this factor, detailed models of 2D horizontal slices of human and sheep thorax have been developed and validated with the limited data available in the open literature. The main goal of this study is to verify if the injuries observed in the animal are truly representative of human lung injuries for simple blast loadings at different blast wave orientation. In total, twelve blast directions were simulated for three different blast injury levels on the Bowen curves. The sheep and the human torsos were rotated according to their vertical axis each 30 degree starting from 0 degree to 330 degree. Two types of inputs were generated from the simulations. Results showed that humans have higher tolerance to blast than sheep. Sheep are more dependent to the blast wave duration and orientation.