FIBER REINFORCED COMPOSITE SHELLS SUBJECTED TO AN AIR BLAST LOADING

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The air blast response of circular cylindrical shells with non-isotropic material properties is presented. In particular, this study examines the response of laminated, glass fiber reinforced, epoxy cylinders through
numerical analysis and experiments. The analysis has been undertaken using a nonlinear finite element program developed especially for the study of the blast response of structures. The code is based upon Reissner-Mindlin plate theory, allows full nonlinear geometric effects and a range of implicit time integration schemes. Blast experiments conducted at the Defense Research Establishment Suffield, Ralston, Alberta, Canada were used to provide pressure data as input into the finite element code and strain data as verification. These experiments were designed with a well-defined structural configuration to facilitate the comparison between experiment and analytic models. The time history strains obtained from the finite element analysis compare favorably with those recorded during the blast experiments.