Abstract Submitted
for the SHOCK13 Meeting of
The American Physical Society

Finite Element Based Optimization of Material Parameters for Enhanced Ballistic Protection ARASH RAMEZANI, DANIEL HUBER, HENDRIK ROTHE, University of the Federal Armed Forces, Institute of Automation Technology — The threat imposed by terrorist attacks is a major hazard for military installations, vehicles and other items. The large amounts of firearms and projectiles that are available, pose serious threats to military forces and even civilian facilities. An important task for international research and development is to avert danger to life and limb. This work will evaluate the effect of modern armor with numerical simulations. It will also provide a brief overview of ballistic tests in order to offer some basic knowledge of the subject, serving as a basis for the comparison of simulation results. The objective of this work is to develop and improve the modern armor used in the security sector. Numerical simulations should replace the expensive ballistic tests and find vulnerabilities of items and structures. By progressively changing the material parameters, the armor is to be optimized. Using a sensitivity analysis, information regarding decisive variables is yielded and vulnerabilities are easily found and eliminated afterwards. To facilitate the simulation, advanced numerical techniques have been employed in the analyses.

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Date submitted: 03 May 2013 Electronic form version 1.4