Abstract Submitted
for the SHOCK15 Meeting of
The American Physical Society

Development of Impact Model for Water Ice[1] PHILIP CHURCH, PETER GOULD, IAN LEWTAS, QinetiQ, ANDY JARDINE, CHRIS BRAITHWAITE, KATIE JARMAN, Cambridge, QINETIQ TEAM, CAMBRIDGE TEAM
— This work, which is supported by the European Space Agency (ESA) is in support of Penetrator technology development for a potential mission to Europa or other icy bodies. An ice model has been constructed to predict the shock and impact behaviour of water ice. The equation of state is based on the theoretical Porter-Gould approach and is capable of predicting the shock response of ice. The constitutive model is based on a Johnson-Holmquist model and is constructed from a combination of low and high rate compression tests and a simple spall model is included. The model has been incorporated into the GRIM and DYNA hydrocodes and has been validated for impacts of ball-bearings into very well controlled ice blocks. The results are discussed and future studies are suggested.

[1]funding from ESA

Philip Church
QinetiQ

Date submitted: 27 Jan 2015 Electronic form version 1.4