

5th World Congress on

SMART AND EMERGING MATERIALS

April 19-20, 2018 Dubai, UAE



Mojtaba Moatamedi

UiT The Arctic University of Norway, Norway

Multiphysics: Materials challenges in industrial applications

Multiphysics simulation is a relatively new class of analysis in the field of engineering and science. Previously numerical modelling involving both fluid and structure was undertaken using two separate codes, a Computational Fluid Dynamics (CFD) code for the fluid analysis and a Finite Element Analysis (FEA) code for the structural response. Recent advances in technology now enable the modelling of both fluid and structure within a single code enabling a fully coupled analysis to be performed. This talk concentrates upon a number of applications concerned with the multiphysics modelling in real industrial problems involving new materials challenges. These problems include a series of experimental data and simulations such as concorde accident investigation, airbag certification, nuclear incident and other complex investigations. Experimental verification and validation of the numerical codes is essential in such practical applications to reduce the cost and enhance safety in design and manufacturing. The comparison between experiment and numerical analysis will be discussed in the above-mentioned applications.

References

1. Khawaja, H.A.; Messahel, R.; Ewan, B.; Souli, M.; Moatamedi, M., 'Experimental and numerical study of pressure in a shock tube', *Journal of Pressure vessel Technology*, 138(4), (2016), 041301:1-6
2. Messahel, R.; Souli, M.; Cohen, B.; Moatamedi, M.; Aquelet, N., 'Numerical and Experimental Investigations of Water Hammers in Nuclear Industry', *The International Journal of Multiphysics*, 9(1), (2015), 21-36
3. Mughal, U.N.; Khawaja, H.; Moatamedi, M., 'Finite Element Analysis of Human Femur Bone', *The International Journal of Multiphysics*, 9(2), (2015), 101-108
4. Micallef, K.; Fallah, A.S.; Pope, D.J.; Moatamedi, M.; Louca, L.A., 'On dimensionless loading parameters for close-in blasts', *The International Journal of Multiphysics*, 9(2), (2015), 171-193
5. Moatamedi, M.; Souli, M.; Al-Bahkali, E., 'Fluid Structure Modelling of Blood Flow in Vessels', *MCB: Molecular and Cellular Biomechanics*, 11(4), (2014), 221-234

Recent Publications

1. Ahmad, T; Rashid, T; Khawaja, H.A.; Moatamedi, M., 'Study of the required thermal insulation (IREQ) of clothing using infrared imaging', *The International Journal of Multiphysics* (2017), 11 (4), 413-426
2. Khawaja, H.A.; Messahel, R.; Al-Bahkali, E; Souli, M.; Moatamedi, M., 'Fluid solid interaction simulation of CFRP shell structure', *Mathematics in Engineering, Science and Aerospace (MESA)*, 8(3), (2017), 311-324.

Biography

Mojtaba Moatamedi is currently the Chair of Multiphysics at UiT The Arctic University of Norway where he is the Director of Multiphysics Centre. He completed his MSc and PhD at The University of Sheffield, MBA at Manchester Business School of The University of Manchester; and LL.M International Business Law at The University of Leeds. He has an extensive experience in modelling and simulation particularly in multiphysics approach to industrial investigation. He has held senior managerial and research positions in many institutes including Cranfield University, Imperial College London, and the University of Manchester. He is a Fellow of the Royal Aeronautical Society and the Nuclear Institute, and a member of ASME. He is the Vice Chairman of the Association of Aerospace Universities and a member of the Council and the Board of Directors of NAFEMS. He is the Founding President of The International Society of Multiphysics (www.multiphysics.org).

mojtaba.moatamedi@uit.no