Andrew Davis
Associate Scientist
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Education and Training

The University of Birmingham, United Kingdom PhD – Nuclear Physics, 2010
MSc – Physics and Technology of Nuclear Reactors, 2005
BSc – Physics and Astrophysics, 2004

Research and Professional Experience

Assistant Scientist, University of Madison-Wisconsin (Aug 2012 – present)

- Support the existing neutronics development program at UW
- Develop improvements to DAG Framework to improve efficiency and capabilities
- Develop software for the improvement of meshes and testing of existing geometries
- Validation of MC codes and accompanying of nuclear data
- Perform material damage calculations in support of fusion program
- Support ITER and external contract work

Neutronics Analyst, Culham Centre for Fusion Energy, United Kingdom Atomic Energy Authority, Culham, Abingdon, Oxfordshire, UK (2009-2012)

- Lead the neutronics R&D effort at CCFE
- Sofware development of internal codes
- Represented CCFE at the annual ITER neutronics meetings
- Represented CCFE at a number of international conferences
- Taught 18 hour course on Neutron Transport Theory at the University of Birmingham, UK

Neutronics Analyst, United Kingdom Atomic Energy Authority Dounreay, Thurso, Caithness, UK, (2005-2006)

- Performed research into the calibration of neutron and photon Non-Destructive Assay systems
- Design experiments to validate monte carlo simulations

Selected Publications

- “Shutdown dose rate analysis with CAD geometry, Cartesian/tetrahedral mesh, and advanced variance reduction”, Elliott D. Biondo, Andrew Davis, Paul P.H. Wilson, Fusion Engineering and Design, Volume 106, May 2016, Pages 77-84

- “The fusion nuclear science facility, the critical step in the pathway to fusion energy”, CE Kessel, JP Blanchard, A Davis, L El-Guebaly, N Ghoniem, PW Humrickhouse, S Malang, BJ Merrill, NB Morley, GH Neilson, ME Rensink, TD Rognlien, AF Rowcliffe, S Smolentsev, LL Snead, MS Tillack, P Titus, LM Waganer, A Ying, K Young, Y Zhai, Fusion Science and Technology, Volume 68, 2, 225-236pp

- “CAD BASED HIGH ENERGY PARTICLE TRANSPORT USING DAGMC TOOLKIT”,

A Davis, PPH Wilson, KT Lee, Conference Proceeding of M&C 2015, Nashville TN, 2015

- Developments and needs in nuclear analysis of fusion technology, R. Pampin, A. Davis, J. Izquierdo, D. Leichtle, M.J. Loughlin, J. Sanz, A. Turner, R. Villari, P.P.H. Wilson, Fusion Engineering and Design, June 2013

- First neutronics analysis for ITER bio-shield equatorial port plug, Tongqiang Dang, Dongchuan Ying, Qi Yang, Michael Loughlin, Andrew Davis, Fusion Engineering and Design, Volume 87, Issues 7–8, August 2012, Pages 1447-1452

- Application of novel global variance reduction methods to fusion radiation transport problems, A Davis and A Turner, International Conference on Mathematics and Computational Methods Applied to Nuclear Science and Engineering (M&C 2011) , Rio de Janeiro, RJ, Brazil, May 8-12, 2011

- A Davis, A Turner, Comparison of global variance reduction techniques for Monte Carlo radiation transport simulations of ITER, Fusion Engineering and Design, Volume 86, Issues 9-11,October 2011, Pages 2698-2700

- A. Davis, R. Pampin, Benchmarking the MCR2S system for high resolution activation dose analysis in ITER, Fusion Engineering and Design, Volume 85, Issue 1, January 2010, Pages 87-92

- R. Pampin, A. Davis, R.A. Forrest et al., Status of novel tools for estimation of activation dose, Fusion Engineering and Design, Volume 85, Issues 1012, December 2010, Pages 2080-2085

- A. Borthwick, G. Agarici, A. Davis et al, Mechanical design features and challenges for the ITER ICRH antenna, Fusion Engineering and Design, Volume 84, Issues 26, June 2009,
  Pages 493-496

Synergistic Activities

Awards: Best poster award SOFT-10 - " Comparison of global variance reduction techniques for Monte Carlo radiation transport simulations of ITER"
Career Highlights: Development of MCR2S software to perform rigorous shutdown dose rate calculations in fusion devices, now used widely within Europe.

Collaborators at other institutions

J-C Sublet, CCFE, UK	A Turner, CCFE, UK	R Pampin, Fusion For Energy, EU
M Loughlin, ITER	J Lepannen, VTT, Finland	J-C Trama, CEA, France
S Lilley, CCFE, UK	K T Lee, NASA	J Apostolakis, CERN, Switzerland