

Published papers:

Numerical study on effect of relative humidity (and fuel moisture) on modes of grassfire propagation. Moinuddin, K. A. M., Khan, N., and Sutherland, D., Fire Safety Journal, 125, (2021).

A response to comments of Cruz et al. on: 'Simulation study of grass fire using a physics-based model: Striving towards numerical rigour and the effect of grass height on the rate of spread'. Sutherland, D., Sharples, J. J., Mell, W., and Moinuddin, K. A. M. International Journal of Wildland Fire, 30(3), 221-223. (2021).

A response to comments of Cruz et al. on: 'The effect of ignition protocol on the spread rate of grass fires'. Sutherland, D., Sharples, J. J., and Moinuddin, K. A. M. International Journal of Wildland Fire, 29(12), 1139-1141 (2020).

Physics-Based Simulations of Flow and Fire Development Downstream of a Canopy. Accary, G., Sutherland, D., Frangieh, N., Moinuddin, K., Shamseddine, I., Meradji, S. and Morvan, D., Atmosphere, 11(7), p.683, (2020).

The effect of ignition protocol on grassfire development. Sutherland, D., Sharples, J.J. and Moinuddin, K.A.M ,Int. J. Wildland Fire, 29(1), pp.70-80. (2020)

Modelling of tree fires and fires transitioning from the forest floor to the canopy with a physics-based model. Moinuddin, K.A.M. and Sutherland, D. Mathematics and Computers in Simulation, 175, pp.81-95 (2020).

Simulations of radiation heat flux on a structure from a fire in an idealised shrubland. Moinuddin, K. and Sutherland, D. Australian Journal of Emergency Management Monograph, 4, pp.26-31. (2019)

Physics-based simulation of heat load on structures for improving construction standards for bushfire prone areas. Khan, N., Sutherland, D., Wadhwani, R. and Moinuddin, K., Frontiers in Mechanical Engineering, 5, p.35. (2019)

Simulation study of grass fire using a physics-based model: Striving towards numerical rigour and the effect of grass height on the rate of spread. Moinuddin, K. A. M., Sutherland, D., and Mell, W., International Journal of Wildland Fire, 27(12), pp.800-814. (2018).

Verification of a Lagrangian particle model for short-range firebrand transport R. Wadhwani, D. Sutherland, A. Ooi, K. Moinuddin, G. Thorpe, Fire Saf. J. Online (2017).

Kinetics of pyrolysis of litter materials from pine and eucalyptus forests R. Wadhwani, D. Sutherland, K. A. M. Moinuddin, P. Joseph, J. Therm. Anal. Calorim. (2017).

The effect of slip length on vortex rebound from a rigid boundary D. Sutherland, C. Macaskill, and D. G. Dritschel, Phys. Fluids 25, 093104 (2013);

Presentations and peer-reviewed conference papers:

Application of neural networks to rate of spread estimation in shrublands. R. Wadhwani, D. Sutherland, K. A. M. Moinuddin, J. Sharples. Submitted to the 24th International Congress on Modelling and Simulation MODSIM 2021. Accepted.

Improvement of particle drag model of Fire Dynamics Simulator for non-burning fire-brand transport R. Wadhvani, D. Sutherland, G. Thorpe, K. A. M. Moinuddin. Submitted to the 24th International Congress on Modelling and Simulation MODSIM 2021. Accepted.

Entrainment and Mixing of Gravity Currents in a Stratified Ambient A. Ooi, L. Chan, Y. Cao, T. Nguyen, K. A. M. Moinuddin, D. Sutherland, R. Manasseh, A. Dai. Accepted in: 12th Australasian Heat and Mass Transfer Conference 2021, however, the conference was postponed due to the covid19 pandemic.

Physics-based simulations of fire development downstream a canopy Frangieh, N., Accary, G., Meradji, S., Morvan, D., Sutherland, D. and Moinuddin, K in 23rd International Congress on Modelling and Simulation MODSIM 2019

The flow over a forested hill Khan, N., Sutherland, D. and Moinuddin, K in 23rd International Congress on Modelling and Simulation MODSIM 2019

A computational study on the implication of derived wind reduction factor in predicting fire rate of spread Rashid, M.A., Hilton, J.E., Khan, N., Sutherland, D. and Moinuddin, K in 23rd International Congress on Modelling and Simulation MODSIM 2019

Agent-based modelling of bushfire evacuations and the decision-making processes of evacuees Rose, D., Kim, P.S., Sutherland, D. and Sharples, J.J in 23rd International Congress on Modelling and Simulation MODSIM 2019

Using Windninja data into Fire Dynamics Simulator for faster fire simulations Singha Roy, S., Sutherland, D. and Moinuddin, K. in 23rd International Congress on Modelling and Simulation MODSIM 2019

Simulated transport of short-range embers in an idealised bushfire. Wadhvani, R., Sutherland, D. and Moinuddin, K. In Proceedings for the 6th International Fire Behavior and Fuels Conference. International Association of Wildland Fire. (2019)

A comparative study of wind fields generated by different inlet parameters and their effects on fire spread using Fire Dynamics Simulator. Singha Roy, S., Sutherland, D., Khan, N. and Moinuddin, K. In Proceedings of the 21st Australasian Fluid Mechanics Conference. Australasian Fluid Mechanics Society, 2018.

Numerical assessment of composite bridges subjected to Wildland Urban Interface fires A. P. Dissanayake, S. Setunge, S. Venkatesan, K. A. M. Moinuddin, D. Sutherland. In Maintenance, Safety, Risk, Management and Life-Cycle Performance of Bridges, 2018, Powers, Frangopol, Al-Mahaidi and Caprani (Eds) Taylor and Francis Group, London.

Large-eddy simulation of neutral atmospheric boundary layer flow over heterogeneous tree canopies D. Sutherland, K. Moinuddin, A. Ooi. in Proceedings of the AFAC conference, Sydney, September 2017.

Physics-based modelling of tree fires and fires transitioning from the forest floor to the canopy K. A. M. Moinuddin, D. Sutherland. MODSIM conference, Hobart, December 2017 (Accepted).

A suitable pyrolysis model for physics-based bushfire simulation R. Wadhvani, D. Sutherland, K. Moinuddin Asia-Pacific Conference on Combustion. December 2017 (Accepted).

Law-of-the-wall in mixed convection in a vertical channel Duncan Sutherland, Daniel Chung,

Andrew Ooi, Elie Bou-Zied, Khalid Moinuddin, and Graham Thorpe, American Physical Society Division of Fluid Dynamics, Boston, USA, 2015.

Vortex interaction with a rigid wall: generation, detachment, and merger of critical points Duncan Sutherland and Charlie Macaskill, ANZIAM Conference Rotorua, New Zealand, 2014;

Energy dissipating structures generated by dipole-wall collisions at high Reynolds number Duncan Sutherland, Charlie Macaskill and David Dritschel, ANZIAM Conference Warnambool, Victoria, 2012;

The influence matrix method for viscous flows Duncan Sutherland, Charlie Macaskill and David Dritschel, ANZIAM Conference Glenelg, South Australia, 2011;

Incorporation of viscous effects in CASL-type models Charlie Macaskill and Duncan Sutherland, Seminar Vortex Dynamics Research Group, St Andrews University, 2010;

Cheybshev Spectral Methods for Quasigeostrophic Flows Duncan Sutherland, Australia and New Zealand Industrial and Applied Mathematics (ANZIAM) Conference Queenstown, New Zealand, 2010.

Under review:

Firebrand transport from a novel firebrand generator: Numerical simulation of laboratory experiments R. Wadhvani, D. Sutherland, A. Ooi, K. A. M. Moinuddin. International Journal of Wildland Fire, Decision received: revisions required.

Physics-based simulations of grassfire propagation on sloped terrain at field-scale: flame dynamics, mode of propagation and the heat fluxes J. Innocent, D. Sutherland, N. Khan, K. A. M. Moinuddin. Submitted to International Journal of Wildland Fire and under review.

Physics-based simulations of grassfire propagation on sloped terrain at field-scale: motivations, model reliability, rate of spread and fire intensity J. Innocent, D. Sutherland, N. Khan, K. A. M. Moinuddin. Submitted to International Journal of Wildland Fire and under review.

Implementation of spatially-varying wind reduction factor for wildfire simulations D. Sutherland, M. Rashid, J. Hilton, K. A. M. Moinuddin. Submitted to Environmental Modelling and Software and under review.