AS 3959 Results for Scrub at FDI 100

Radiative heat flux vs firebrand flux at BALs

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Adjusted the distance between the fire front and the edge of the forest to 7 m

Estimated flame angles-Scrub vegetation

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| **Case** | **Scrub vegetation-corresponding flame angle calculation by the algorithm** | | | | |
| **BAL 12.5** | **BAL 19** | **BAL 29** | **BAL 40** | **BAL FZ** |
| FDI 100 | 76.968 | 67.523 | 58.802 | 45.103 | 52.8 |
| FDI 80 | 78.022 | 69.389 | 61.541 | 49.566 | 48.795 |
| FDI 50 | 80.407 | 73.566 | 67.517 | 58.708 | 34.403 |

Estimated radiative heat flux for the estimated flame angles and simulation radiative heat flux (FDI 100)

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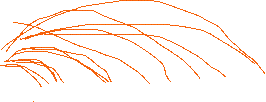
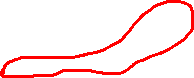
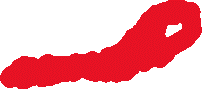
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| **Edge-to-fire distance** | **Radiative heat flux (kW/m2)** | | | | |
| **BAL 12.5** | **BAL 19** | **BAL 29** | **BAL 40** | **BAL FZ** |
| 5 m | NA | 26.76 | NA | NA | NA |
| 7 m | 4.45 | 24.56 | 37.18 | NA | NA |
| 10 m | NA | 8.87 | 13.96 | 88.77 | NA |

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|  | **Radiative heat flux (kW/m2) (calculated by Algorithm)** | | | | |
| **BAL 12.5** | **BAL 19** | **BAL 29** | **BAL 40** | **BAL FZ** |
| FDI 100-algo | 2.22 | 17.73 | 30.62 | 46.25 | 68.81 |
| FDI 80-algo | 2.15 | 16.01 | 27.75 | 42.01 | 68.81 |
| FDI 50-algo | 1.89 | 12.36 | 21.56 | 32.76 | 68.81 |

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|  | **Radiative heat flux (kW/m2) (simulation: forest edge-fireline=7 m)** | | | | |
| **BAL 12.5** | **BAL 19** | **BAL 29** | **BAL 40** | **BAL FZ** |
| FDI 100-sim | 4.45 | 24.56 | 37.18 |  |  |
| FDI 80-sim |  |  | 17 |  |  |
| FDI 50-sim |  |  | 13.06 |  |  |

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|  | **Radiative heat flux (kW/m2) (simulation: forest edge-fireline=5 m)** | | | | |
| **BAL 12.5** | **BAL 19** | **BAL 29** | **BAL 40** | **BAL FZ** |
| FDI 100-sim |  |  | 37.44 |  |  |
| FDI 80-sim |  |  | 20.79 |  |  |
| FDI 50-sim |  |  | 18.75 |  |  |

Firebrand flux distribution



**forest edge-fireline**

Sensitivity Analysis-Fuel consumption

Case: Forest FDI 100 BAL 29

Vary the fuel consumption as 20%, 40%, 60%, 80%, and Filkov et al. (Canopy consumption:62% and understory consumption:37%)

1. Firebrand flux

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1. Maximum radiative heat flux

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1. Maximum convective heat flux

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1. Firebrand flux through vertical planes

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1. Firebrand flux on horizontal planes

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