Firebrand flux

186 m

0 m

320 m

FBP X

FBP Y

FBP Z

FCS X

FCS Y

FCS Z

Fire line

Road

320 m

160 m

300 m

250 m

150 m

100 m

50 m

Case A: 2 m

Case B,C: 7m

Pineland National Reserve prescribed burning (Filkove et al.)

1. Increasing the Fireline depth

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Case | Firebrand initial  Temperature  (0C) | Particle velocity  (U,V,W) m/s | Ember input rate pcs/s | Flux (pcs/m2/s) | | |
| FCS Z | FCS Y | FCS X |
| **A**:depth 7m | 900 | (8.3, 0.0, 2.1) | 11 171 | 1.375 | 1.082 | 0.870 |
| Experiment | NA | NA | NA | 1.335 | 0.902 | 0.824 |
| Difference (%) | | | | -2.0 | 16.7 | 5.3 |

|  |
| --- |
| Landing firebrand flux vs size comparison of the experiment and the simulation -  (fireline depth 7m and Firebrand temperature T=900 0C). We assumed the densities of firebrands change during the flight due to moisture evaporation and pyrolysis. The density variation in terms of % of initial density were taken again from IMFSE thesis (see page 66 Fig. 30) and our firebrands densities were adjusted according to that. |
|  |

Firebrand input rate (Case B and C) = 11 171 pcs/s

Average HRR = 2672 MW

Firebrand generation rate =(11 171 pcs/s)/(2672 MW)

=4.181 pcs/MW/s