1. Find the **effect of the** **initial temperature** of firebrands for their trajectories and the landing distribution

Maintained domain size, thermo-physical parameters, fuel loads etc. same for both cases used for the comparison

* Firebrand initial temperature case 1: **361 0C** (Wadhwani et al.)
* Firebrand initial temperature case 2: **1044 0C** (Leo Willem et al.)

(simulation time 23 hrs)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Case | Grid size (m) | Avg. Wind (m/s) | Firebrand initial T (0C) | FCS Z | | FCS Y | | FCS X | |
| Flux (pcs/m2/s) | Difference  (%) | Flux (pcs/m2/s) | Difference  (%) | Flux (pcs/m2/s) | Difference  (%) |
| 1 | 1.5 | 2.16 | 361 (Wadhwani) | 1.3927 | -0.48 | 1.7881 | +4.86 | 0.7522 | +7.98 |
| 2 | 1.5 | 2.24 | 1044 (Leo) | 1.3994 | 1.7011 | 0.6921 |

1. Increasing the Fireline depth

Case A: 2 m (x=186 m to 188 m)

Case B: 7 m (x=183.5 m to 190.5 m)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Case | Wind velocity  (m/s) | Particle velocity  (U,V,W) m/s | Ember input rate pcs/s | Flux (pcs/m2/s) | | |
| FCS Z | FCS Y | FCS X |
| **A**:depth 2m | ≈2.2 | (8.3, 0.0, 2.1) | 11006 | 1.946 | 0.977 | 0.798 |
| **B**:depth 7 m | ≈2.26 | (8.3, 0.0, 2.1) | 11006 | 2.118 | 0.774 | 0.553 |
| Experiment | 1.4±0.6 | NA | NA | 1.361 | 0.902 | 0.824 |

Firebrand flux differences

|  |  |  |  |
| --- | --- | --- | --- |
|  | Difference (%) | | |
| FCS Z | FCS Y | FCS X |
| Case **A** to Experiment | 30.0 | 7.6 | -3.3 |
| Case **B** to Experiment | 35.7 | -16.5 | -49.0 |

\*\*Currently, another simulation is running after an adjustment to the input number and the composition of firebrands