Single tree burning

Douglas fir tree burning

Examined **NU\_MATL** and **NU\_SPEC**

1. Grid 50 mm +Haider Drag model + (NU\_MATL = **0.69**, NU\_SPEC = **0.31**)

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Total mass loss difference between the experiment and the simulation = +8.5%.

1. Grid 50 mm +Haider Drag model + (NU\_MATL = **0.61**, NU\_SPEC = **0.39**)

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Total mass loss difference between the experiment and the simulation = -13%

Grid convergence

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Heat release rate

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| HRR (grids 100 mm, 75 mm, 50 mm,37.5 mm) |
| HRR (experiment vs Simulation) |

Content

**Single tree burning**

* Grid independence in terms of GCI/graphically using MLR
* Validation of MLR against the experiment
* Firebrand initial velocity (trial and error) to reach them onto the collection pans
* Firebrand input rate, fire intensity vs time plot
* Inverse analysis inputting different multiplications of collection number to match the experiment
* Firebrand distribution contour maps
* Code modification and contour maps
* Calculating pcs/MW/s

**Prescribed forest fire**

* Parameter table and inputs from single tree burning
* Grid independence (time-averaged U, T)
* Model set up
* Obtaining a developed wind field
* Firebrands’ initial velocity adjustment
* Inverse analysis
* Flux, number density plots of X, Y, Z locations
* T, V, input rates profiles
* Correlation od pcs/MW/s

**Adjustment of firebrand generation to use in AS3959**

* Hudson and Bahrani’s experiments
* Matching vegetations from AS3959 and the experiments of Hudson and Bahrani
* Developing correlations to quantify the effects of FMC, Wind and species for firebrand generation
* Find firebrand generation ratio and summary table