**Supplementary Material**

# Development of a field deployable firebrand flux and condition measurement system

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To provide time-resolved data, thus information on the fluxes, each collection site was equipped with a camcorder installed on a pole 1.50 m above the ground where the 15 cans lied. The recorded footage was then analysed to automatically extract the arrival time of firebrands within the cans. The temporal signal of the number of firebrands reaching the collection site obtained from the analysis is characterized by several high frequency oscillations. A careful exam of the footage revealed that such oscillations are mostly associated to moving particles (e.g. flying or changing position within the can after being deposited) or changes in light conditions. To get rid of the spurious oscillations, the original signal was filtered with a Savitzky-Golay filter.

However, the new position occupied by a particle moved by the wind within the can, as well as an ember hovering the can at the moment the frame was taken, is interpreted as a new particle reaching the can. It is therefore not possible to estimate the right number of firebrands that have reached the cans within the collection site from the footage.

Nevertheless, by getting rid of the high oscillations we can keep the changes associated to the firebrand showers. Therefore, the image analysis of the video recorded at the collection sites during the experiments does not allow to quantify the number or the dimensions of the embers but it allows the temporal behaviour to be estimated. Finally, the signal was hyper simplified to the only peaks and the associated cumulative function computed.

A complementary analysis was conducted by classifying all the images taken from the all the cans disposed on the collection sites during the experiments to extract information on the area of the firebrands and estimate their total number. To guarantee a standard picture for all the cans the cans were accommodated in the same position and a 360° illumination prevented shadows from the lateral wall of the can. In order to express the firebrands area in m2 a picture of an empty can containing a penny was taken as reference image.

Finally, the cumulative function extracted from the analysis of the visual footage was normalized to 1, such that it could be applied to the number of embers extracted from the analysis of the static imageries. An example of the method applied is shown below, while the result is shown in the attached animation along with the fire behaviour.

