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Experimental understanding of wildland fires

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The experimental study of natural fires to better understand their behaviour and develop fire-spread models is the topic of a very large literature. Experimental activities cover many subjects related to wildland fires including among others: fire behaviour, fire impact, fuel characterization, fire emissions and fire detection. This presentation is focused on the experiments, particularly the spreading and burning dynamic of the flame front. It does not intent to be exhaustive but aims to an overview of research in the the last decades.
The experimental approach in wildland fire behaviour follows the classical empirical scientific approach: observe the phenomenon to understand it, develop models to describe it and use experiments to implement and test the models. Therefore, experiments are intimately linked with the development of modelling. Experiments are developed to increase our understanding of the chemical and physical phenomena that drive fire ignition, spread and extinction, upon which fire spread models are built. Other experiments are developed to set model parameters and to validate the predictions. The work is divided into the different scales of the physical and chemical phenomena: the micro-scale, the small and large-scale laboratory scale and the field-scale.