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The Ring of Fire: The Effects of Slope upon Pattern Formation in Simulated Forest Fire Systems ROBIN MORILLO, NIKLAS MANZ, College of Wooster — We report about spreading fire fronts under sloped conditions using the general cellular automaton model and data from physical scaled-down experiments. Punckt *et al.* published experimental and computational results for planar systems [*Wildfires in the Lab: Simple Experiment and Models for the Exploration of Excitable Dynamics*, J. Chem. Educ. **92**(8), 1330-1337, 2015] and our preliminary results confirmed the expected speed-slope dependence of fire fronts propagating up or down the hill with a cut-off slope value above which no fire front can exist. Here we focus on two fascinating structures in reaction-diffusion systems: circular expanding target pattern and rotating spirals. We investigated the behaviors of both structures with varied values for the slope of the forest and the homogeneity of the trees. For both variables, a range of values was found for which target pattern or spiral formation was possible.

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