



# *PIMS Mathematical Biology Seminar*



**Monday, February 25, 2008  
3 pm – 657 CAB**

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## *The effect of wind on the propagation of forest fires*

Wind is one of the main forces affecting the rate of forest fire spread. It may either increase or decrease the energy transferred toward the unburned areas. The present study is devoted to understanding the effect of wind on the propagation of forest fires. To model the propagation of forest fires a semi-physical approach is used. By this approach forest fire is considered as an adiabatic combustion process for solid fuel.

In our study we analyze the behavior of combustion waves for different wind velocities. Three types of wind velocity with respect to burning region are considered. When the wind velocity is zero or the wind blows towards an unburned region, the existence and uniqueness of the traveling wave is proven. However, the situation is much more interesting when the wind blows towards the burning region. In such case a, there might be no combustion waves, one combustion wave or even two combustion waves. In particular, two combustion waves are observed when the wind velocity is small. When the wind velocity is large, there are no combustion waves. In my talk, I will discuss the approach for study of combustion wave problem and discuss the physical scenarios for obtained results.

This is a joint work with Prof. Thomas Hillen

*Join us for refreshments in CAB 549 immediately following the seminar*

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