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Benito Chen-Charpentier (bmchen@uta.edu) and **Maria C.A. Leite***
(maria.leite@utoledo.edu). *A model for coupling wildfire and insect outbreak in forests.*

Wildfire and insect infestations are two major natural disturbances of forest lands in the United States. The potential interaction between insect outbreak and wildfire is rarely explored in a model framework and it is a challenging task. The association between insect and fire dynamics is complex, particularly when evaluated over time and at large scale, and no consensus exist in the published literature about its consequences on forest dynamics. In this talk we discuss mathematical models incorporating the effect of insect outbreaks either as a single disturbance in the forest population dynamics or coupled with wildfire disturbances. We will show that 1) the beetle-tree system parametrized model exhibits the well known temporal dynamics of beetle-tree interaction described by the dual equilibria theory. 2) The beetle-tree-fire model reveals the existence of positive feedback between wildfire and insect outbreak disturbances in certain region of fire strength, which agrees with one of the several current theories in the field. (Received August 13, 2013)