

ACMS Applied Math Seminar

Mary Silber
Thursday, April 14
154 Hurley Hall
3:30- 4:30 PM



Assessing the Robustness of Spatial Pattern Sequences in a Dryland Vegetation Model

A particular sequence of 'gaps->labyrinths->spots' occurs with decreasing precipitation in previously reported numerical simulations of reaction-diffusion partial differential equation dryland vegetation models. These observations have led to the suggestion that this sequence of patterns can serve as an early indicator of desertification in some ecosystems. Because parameter values in the vegetation models can take on a range of plausible values, it is important to investigate whether the pattern sequence prediction is robust to variation. For a particular model, we find that a quantity calculated via bifurcation-theoretic analysis appears to serve as a proxy for the pattern sequences that occur in numerical simulations across a range of parameter values. We find in further analysis that the quantity takes on values consistent with the standard sequence in an ecologically relevant limit of the model parameter values. This suggests that the standard sequence is a robust prediction of the model.

The Department of Applied and Computational
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