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A model for random fire induced tree-grass coexistence in savannas

Tree-grass coexistence in savanna ecosystems depends strongly on environmental disturbances out of which crucial is fire. Most modeling attempts in the literature lack stochastic approach to fire occurrences which is essential to reflect their unpredictability. Existing models that actually include stochasticity of fire are usually analyzed only numerically. We introduce minimalistic model of tree-grass coexistence where fires occur according to stochastic process. We use the tools of linear semigroup theory to provide more careful mathematical analysis of the model. Essentially we show that there exists a unique stationary distribution of tree and grass biomasses.

References

- [1] P. Klimasara, M. Tyran-Kamińska, *A model for random fire induced tree-grass coexistence in savannas*, *Mathematica Applicanda* 46(1) (2018), 87–96, doi=10.14708/ma.v46i1.6382.