Abstract Submitted
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**Network theory model of the United States Patent citation network**[1] JAN TOBOCHNIK, PETER ERDI, Kalamazoo College, KATHERINE STRANDBURG, DePaul University College of Law, GABOR CSARDI, LASZLO ZALANYI, Department of Biophysics, KFKI Research Institute — We report results of a network theory approach to the study of the United States patent system. We model the patent citation network as a discrete time, discrete space stochastic dynamic system. From data on more than two million patents and their citations, we extract an attractiveness function, $A(k,l)$, which determines the likelihood that a patent will be cited. A(k,l) is approximately separable into a product of a function $A_k(k)$ and a function $A_l(l)$, where $k$ is the number of citations already received (in-degree) and $l$ is the age measured in patent number units. $A_l(l)$ displays a peak at low $l$ and a long power law tail, suggesting that some patented technologies have very long-term effects. $A_k(k)$ exhibits super-linear preferential attachment. The preferential attachment exponent has been increasing since 1991, suggesting that patent citations are increasingly concentrated on a relatively small number of patents. The overall average probability that a new patent will be cited by a given patent has increased slightly during the same period.

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