

Small World Properties Generated by a New Algorithm Under Same Degree of All Nodes

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Abstract: Based on the model of the same degree of all nodes we proposed before, a new algorithm, the so-called "spread all over vertices" (SAV) algorithm, is proposed for generating small-world properties from a regular ring lattices. During randomly rewiring connections the SAV is used to keep the unchanged number of links. Comparing the SAV algorithm with the Watts-Strogatz model and the "spread all over boundaries" algorithm, three methods can have the same topological properties of the small world networks. These results offer diverse formation of small world networks. It is helpful to the research of some applications for dynamics of mutual oscillator inside nodes and interacting automata associated with networks.

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Key words: small world network, the same degree of all nodes in the network, "spread all over vertices" algorithm, average shortest path length, average clustering coefficient

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