

Synchronization and Control of Halo-Chaos in Beam Transport Network with Small World Topology

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Abstract: The synchronous conditions of two kinds of the small-world (SW) network are studied. The small world topology can affect on dynamical behaviors of the beam transport network (BTN) largely, if the BTN is constructed with the SW topology, the global linear coupling and special linear feedback can realize the synchronization control of beam halo-chaos as well as periodic state in the BTN with the SW topology, respectively. This important result can provide an effective way for the experimental study and the engineering design of the BTN in the high-current accelerator driven radioactive clean nuclear power systems, and may have potential use in prospective applications for halo-chaos secure communication.

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Key words: beam halo-chaos, synchronization control, small-world network, beam transport network, global linear coupling, special linear feedback

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