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Synchronization in a chain of nearest neighbors coupled oscillators with fixed ends YINKA FUWAPE, Federal University of Technology,Akure, Nigeria — A system of coupled phase oscillators with nearest neighbors coupling in a chain with fixed ends is investigated. The system synchronizes to a common value of the time averaged frequency which depends on the initial phases of the oscillators at the ends of the chain. The time-averaged frequency decays as the coupling strength increases .Near the transition to the frozen state, the time-averaged frequency has a power law behavior as a function of the coupling strength with synchronized time averaged frequency equal to zero. Associated with this power law, there is an increase in phases of each oscillator with specific jumps with a scaling law of the elapsed time between the jumps. During the interval between the full frequency synchronization and the transition to the frozen state, the maximum Lyapunov exponent indicates quasiperiodicity. Time series analysis of the oscillators frequency shows this quasiperiodicity as the coupling strength increases.

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