

**SYNCHRONIZATION OF TWO COMMON-BASE-COUPLED
NONLINEAR ROTATING-ECCENTRIC-DRIVEN SHAKERS**

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The synchronization, or lock-in, of two coupled, similarly sized rotating-eccentric-driven shakers is studied. The shakers are coupled only by being mounted on a common base, which is suspended on springs and dampers and constrained to translate along a line. This setup models a simplified conceptual version of a no-synchronizing-gearing counter-rotating-eccentric-driven telephone-cable-burying vibrating plow. An approximate quantitative theory of the synchronization of the rotors of these coupled nonlinear autonomous systems is developed in a form that is simple to understand and numerically evaluate. This analysis allows predicting, with good accuracy, whether or not the rotors will synchronize, and if so, to also predict transient and steady state properties of the locked-in motion.

Keywords: Coupled Oscillators, Synchronization, Nonlinear Systems.