

**Rattleback top dynamics: modeling, simulation and experimental results.**  
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Mechanical systems that contain rotating parts (for example vibro-excites, unbalance rotors) are typical in engineering applications and for years have been the subject of intensive studies. One problem of scientific interest, which among others occurs in such systems, is the phenomenon of synchronization of different rotating parts. Despite different initial conditions, after a sufficiently long transient, the rotating parts move in the same way - complete synchronization, or a permanent constant shift is established between their displacements, i.e., the angles of rotation – phase synchronization. Synchronization occurs due to dependence of the periods of rotating elements motion and the displacement of the base on which these elements are mounted.