



# Strange Attractors and Classical Stability Theory

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**Abstract:** Definitions of global attractor,  $B$ -attractor and weak attractor are introduced. Relationships between Lyapunov stability, Poincaré stability and Zhukovsky stability are considered. Perron effects are discussed. Stability and instability criteria by the first approximation are obtained. Lyapunov direct method in dimension theory is introduced. For the Lorenz system necessary and sufficient conditions of existence of homoclinic trajectories are obtained.

**Keywords:** *Attractor, instability, Lyapunov exponent, stability, Poincaré section, Hausdorff dimension, Lorenz system, homoclinic bifurcation.*

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