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Dmitry A Altshuller* (altshuller@ieee.org), 3000 Winona Ave, Burbank, CA 91510. *A General Criterion for Control of Chaos with Feedback.*

The paper considers the problem of controlling chaotic oscillations in second-order systems (which may or may not be Hamiltonian), subjected to excitation of arbitrary and unknown frequency. The unperturbed system is assumed to have two saddle points connected by a separatrix. The objective is to find the feedback that will assure the absence of homoclinic bifurcations, which, in turn, assures that the two-dimensional system does not develop chaotic oscillations. The problem is solved by using the Melnikov's method. It turns out to be possible to estimate the upper bounds of the Melnikov's integrals so that the unknown frequency does not appear in the necessary condition for homoclinic bifurcations. Furthermore, it is not necessary to solve the unperturbed system. The only information required for application of the derived criterion is the equation for the separatrix. For certain special cases, the only information required is the coordinates of the saddle points. (Received September 17, 2007)