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Averaging in the Standard Form Systems of Ordinary Differential Equations

Abstract:

We will consider the formal apparatus of the method of averaging on the most easily illustrated example of the so-called standard systems, which were studied by N.N. Bogolyubov and other authors. Bogolyubov defines a standard system to be a system of ordinary differential equations of the form

$$dx/dt = \varepsilon X(x, t, \varepsilon), \text{ where } x = (x1 ..., xn), X = (X1 , ... Xn)$$

are real vector functions and $\varepsilon > 0$ is a small parameter.

Literature:

1. V.M. VOLOSOV Averaging in systems of ordinary differential equations, 1962 Russ. Math. Surv. 17 1

2. N.N. Bogolyubov and Yu.A. Mitropol'skii, Asymptotic methods in the theory of non-linear oscillations, M., Gostekhizdat, 1955 (2nd edition: 1958; English translation: Gordon and Breach, New York, 1961)