

Abstract Submitted
for the DFD06 Meeting of
The American Physical Society

Acoustic chaos raised by Sommerfeld-Kononenko effect TATYANA KRASNOPOLSKAYA, Institute of Hydromechanics NAS of Ukraine — The vibrations of an infinite plate in contact with an acoustic medium where the plate is subjected to a point excitation by an electric motor of limited power - supply are considered. The whole system is divided into two: “exciter - foundation” and “foundation- plate - medium.” In the system “motor -foundation” three classes of steady state regimes are determined: stationary, periodic and chaotic. The vibrations of the plate and the pressure in the acoustic fluid are described for each of these regimes of excitation. For the first class they are periodic functions of time, for the second they are modulated periodic functions, in general with an infinite number of carrying frequencies, the difference between which is constant. For the last class they correspond to chaotic functions. In another mathematical model where the exciter stands directly on an infinite plate it was shown that chaos might occur in the system due to the feedback influence of waves in the infinite hydro-elastic subsystem to the regime of motor shaft rotation. In this case the process of rotation can be approximately described as a solution of the fourth order nonlinear differential equation and may have the same three classes of steady state regimes as the first model.

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Date submitted: 04 Aug 2006

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