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Translated by A.Y.

REMARK ON THE PAPERS BY R.V.BIRIKH

"ON THE SPECTRUM OF SMALL PERTURBATIONS OF PLANE-PARALLEL COUETTE FLOW"

PMM Vol.29, № 4, 1965, and

"ON SMALL PERTURBATIONS OF A PLANE-PARALLEL FLOW WITH CUBIC VELOCITY PROFILE"

PMM Vol.30, № 2, 1966

(ZAMECHANIE K RABOTAM R.V.BIRIKHA

"O spektre malykh vozmushchenii ploskoparallel'nogo techeniia Kuetta"

PMM T.29, Vyp.4, 1965, i

"O malykh vozmushcheniiakh ploskoparallel'nogo techeniia s kubicheskim profilem skorosti" PMM T.30, Vyp.2, 1966)

PMM Vol.30, № 6, 1966, p.1147

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In the second of the above papers, when the spectrum of decrements of normal perturbations of a flow with cubic velocity profile was discussed, the possibility was indicated of the existence of a vibrational instability in this flow at high Reynolds numbers. In order to verify this hypothesis, a new computation of the decrement spectrum was carried out in a higher approximation by the Galerkin method. The number of basis functions was 36, and the accuracy of assigning the initial data to find the matrix elements was increased to 30 bits (it equalled five decimal places in the preceding computations).

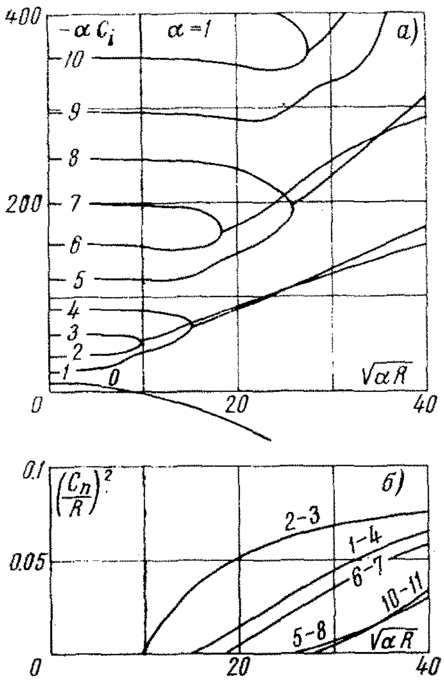

Fig. 1

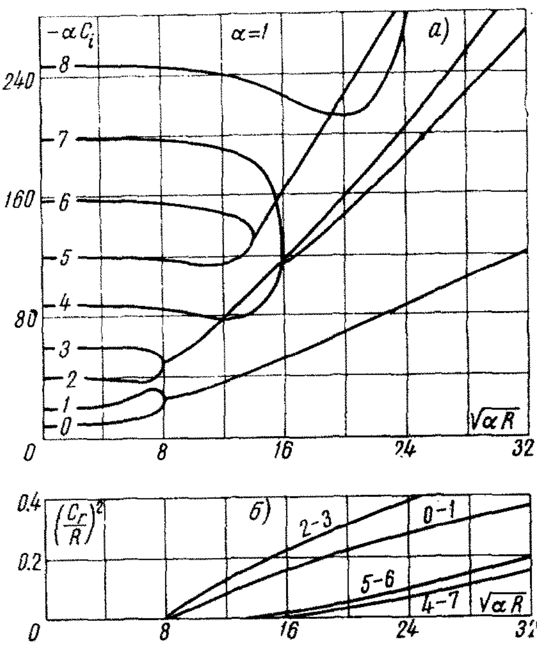

Fig. 2

The behavior of the upper levels of the spectrum turned out to be more responsive to the rise in accuracy of computing the matrix elements than to the increase in the number of basis functions. The spectrum for the wave number $\alpha = 1$ is presented in Fig.1. Results of the computation indicate the absence of a vibrational instability up to at least $\alpha R = 5000$.

The perturbation spectrum for plane-parallel Couette flow was recomputed again. It is shown for $\alpha = 1$ in Fig.2. In both figures c_r and c_i are real and imaginary parts of the complex phase velocity of the perturbations; R is the Reynolds number. The numerals on the curves denote the number of the spectrum level.

Translated by M.D.F.