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Diffusion of adiabatic invariants and mixing in Stokes flows ALIMU ABUDU, DMITRI VAINCHTEIN, Temple University — We discuss a quantitative long-term theory of mixing due to scatterings on resonances in 3-D near-integrable flows. As a model problem we use the flow in the annulus between two coaxial elliptic counter-rotating cylinders. We illustrate that the resonance phenomena cause the jumps of adiabatic invariants and mixing. We show that the resulting mixing can be described in terms of a single 1-D diffusion-type for the probability distribution function. Parameters of the diffusion equation are defined by the averaged statistics of a single passage through resonance.

Dmitri Vainchtein
Temple University

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