Knill, Oliver (1-TX)
Weakly mixing invariant tori of Hamiltonian systems. (English summary)

In [S. H. Lui, Notices Amer. Math. Soc. 44 (1997), no. 4, 432–438; MR1435453], V. I. Arnol’d says that A. N. Kolmogorov’s interest in what we now call KAM theory was largely motivated by the question of whether Hamiltonian systems possess mixing invariant tori. The question as stated remains open; but in the note reviewed here, the author gives an affirmative answer to a weaker form of this question in which “mixing” is replaced by “weakly mixing”. More precisely, any finite- or infinite-dimensional real-analytic Hamiltonian system with a quasi-periodic invariant KAM torus of finite dimension $d \geq 2$ may be perturbed in such a way that the new real-analytic Hamiltonian system has a weakly mixing invariant torus of the same dimension. The result is proved using “Poincaré’s trick” together with a generalization to higher dimensions of a theorem of M. D. Šklover [Izv. Vysš. Učebn. Zaved. Matematika 1967, no. 10 (65), 113–124; MR0226147] on the existence of weakly mixing smooth flows on 2-tori.

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References

12. Weinstein, A.: Periodic orbits for convex Hamiltonian systems. Annals of Mathe-
Note: This list reflects references listed in the original paper as accurately as possible with no attempt to correct errors.

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