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Erratum : “Drift and diffusion in phase space”

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Erratum

For “*Drift and diffusion in phase space*”, by L. Chierchia and G. Gallavotti, in *Ann. Inst. H. Poincaré*, B-60, 1, 1994.

- Statement c), d) of theorem 3 on p. 71 and the reference to them in the following remark are not correct: this is due to a computational error (claiming that δ_{11} is exponentially small) in the corresponding proof in Appendix A13 (first line after (A13.23), page 138) referred to on p. 76.

- Statement c) is never used; the statements are commented in §11 on p. 81, 82. The discussion about lemma 4 is also invalid together with the remark 2 and 4 on p. 84. The parts of §10, §11 unrelated to c), d) are unchanged.

- The only role of statement d) was that of making simpler the discussion of the application in §12 to *a priori* stable problems and it does not affect the results in the sections preceding §10. The application in §12 is therefore incorrect from (12.41) to the final formula (12.43).

Correcting the error in §10, *i.e.* getting a lower bound on the splitting angles becomes a nonperturbative problem. The techniques of appendix A13 were not developed to deal with such cases because the error made the nonperturbative analysis seem unnecessary. They have been developed in the subsequent paper [G] and pushed to a nonperturbative analysis in [GGM]: in the latter work (see §6, 7) a correction to the theorem 3 in §10 quoted above is proposed. Although the splitting is shown to be exponentially small it might be large enough for the method in §12 to apply; but this requires further analysis of the special case in §2, whose result at the moment remains invalid.

- A further error is in §8 after (8.20): the claims on the expansion and contraction rates is correct only if $\varepsilon_{||}^i$ and ε_{\perp}^i are of the same order of magnitude. This forces taking them equal in the rest of the section and therefore the estimated drift time becomes even longer (without other consequences, as the point was to show that the time is finite).

We are indebted to V. Gelfreich for pointing out the first error and to P. Lochak for stimulating and leading the detailed discussion that identified it.

REFERENCES

- [G] G. GALLAVOTTI, Twistless KAM tori, quasi flat homoclinic intersections, and other cancellations in the perturbation series of certain completely integrable hamiltonian systems. A review, *Reviews on Mathematical Physics*, **6**, 343-411, 1994. A substantial part of this paper was developed in collaboration with L. Chierchia: see the acknowledgements.
- [GGM] G. GALLAVOTTI, G. GENTILE and V. MASTROPIETRO, Pendulum: separatrix splitting, down-loadable at mp-arc@math.utexas.edu, #97-472, chao-dyn 9709004, and <http://chimera.roma1.infn.it>.