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Singularities and nonhyperbolic manifolds do not coincide

Nandor Simanyi

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We consider the billiard flow of elastically colliding hard balls on the flat ν-torus ($\nu \ge 2$), and prove that no singularity manifold can even locally coincide with a manifold describing future non-hyperbolicity of the trajectories. As a corollary, we obtain the ergodicity (actually the Bernoulli mixing property) of all such systems, i.e. the verification of the Boltzmann-sinai Ergodic Hypothesis.

Comments:	Final version. Several proofs have been made more transparent, and an illuminating example is provided right after Proposition 2.14
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