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Arithmeticity for Smooth Maximal Rank Positive Entropy Actions of R^k

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We prove an arithmeticity theorem in the context of nonuniform measure rigidity. Adapting machinery developed by A. Katok and F. Rodriguez Hertz [J. Mod. Dyn. 10 (2016), 135–172; MR3503686] for Z^k systems to R^k systems, we show that any maximal rank positive entropy system on a manifold generated by k>=2 commuting vector fields of regularity C^r for r>1 is measure theoretically isomorphic to a constant time change of the suspension of some action of Z^k on the (k+1)-torus or the (k+1)-torus modulo {id,-id} by affine automorphisms with linear parts hyperbolic. Further, the constructed conjugacy has certain smoothness properties. This in particular answers a problem and a conjecture from a prequel paper of Katok and Rodriguez Hertz, joint with B. Kalinin [Ann. of Math. (2) 174 (2011), no. 1, 361–400; MR2811602].

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