

# Uniform stability of high-rank Arithmetic groups

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Lattices in high-rank semisimple groups enjoy several special properties like super-rigidity, quasi-isometric rigidity, first-order rigidity, and more. In this talk, we will add another one: uniform (a.k.a. Ulam) stability. Namely, it will be shown that (most) such lattices  $D$  satisfy: every finite-dimensional unitary "almost-representation" of  $D$  (almost w.r.t. to a sub-multiplicative norm on the complex matrices) is a small deformation of a true unitary representation. This extends a result of Kazhdan (1982) for amenable groups and Burger-Ozawa-Thom (2013) for  $SL(n, Z), n > 2$ . The main technical tool is a new cohomology theory ("asymptotic cohomology") related to bounded cohomology similar to the connection of the last one with ordinary cohomology. The vanishing of  $H^2$  w.r.t. to a suitable module implies the above stability.

The talk is based on a joint work with L. Glebsky, N. Monod, and B. Rangarajan.

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