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A uniform strong spectral gap for congruence covers
of a compact quotient of $\mathrm{PSL}(2, R)^d$

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The existence of a strong spectral gap for lattices in semi-simple Lie groups is crucial in many applications. In particular, for arithmetic lattices it is useful to have bounds for the strong spectral gap that are uniform in the family of congruence covers. When the lattice is itself a congruence group there are uniform and very good bounds for the spectral gap coming from the known bounds towards the Ramanujan–Selberg Conjectures. In this talk I will describe new results, establishing a uniform bound for the strong spectral gap for congruence covers of an irreducible co-compact lattice in $\mathrm{PSL}(2, R)^d$ with $d \geq 2$, which is the simplest and most basic case where the congruence subgroup property is not known.