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Toponogov's theorem and improved Kakeya-Nikodym estimates for eigenfunctions on manifolds of nonpositive curvature

This is joint work with Matthew Blair. Using wave equation techniques and elementary facts from Riemannian geometry, we show that, on negatively curved manifolds, eigenfunctions cannot concentrate near geodesics as measured in L^2 . From this we obtain improved L^p estimates which complement the sup-norm bounds in this setting obtained by Berard in the 1970s. Time permitting, we shall also discuss related joint work with Y. Xi and C. Zhang on period integrals on Riemannian surfaces of negative curvature.