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Xuehua Chen* (dandan.jhu@gmail.com), 404 Krieger Hall, 3400 N. Charles St., Baltimore, MD 21218. *An improvement on eigenfunction restriction estimates for compact boundaryless Riemannian manifolds with nonpositive sectional curvature.* Preliminary report.

Let (M, g) be an n -dimensional compact boundaryless Riemannian manifold with nonpositive sectional curvature, then our conclusion is that we can give improved estimates for the L^p norms of the restrictions of eigenfunctions to smooth submanifolds of dimension k , for $p > \frac{2n}{n-1}$ when $k = n-1$ and $p > 2$ when $k \leq n-2$, compared to the general results of Burq, Gérard and Tzvetkov. We give the improved estimates for $n = 2$, the L^p norms of the restrictions of eigenfunctions to geodesics. Our proof uses the fact that, the exponential map from any point in $x \in M$ is a universal covering map from $\mathbb{R}^2 \simeq T_x M$ to M , which allows us to lift the calculations up to the universal cover $(\mathbb{R}^2, \tilde{g})$, where \tilde{g} is the pullback of g via the exponential map. Then we prove the main estimates by using the Hadamard parametrix for the wave equation on $(\mathbb{R}^2, \tilde{g})$, the stationary phase estimates, and the fact that the principal coefficient of the Hadamard parametrix is bounded, by observations of Sogge and Zelditch. The improved estimates also work for $n \geq 3$, with $p > \frac{4k}{n-1}$. We can then get the full result by interpolation. (Received June 29, 2012)