1017-42-64 **Boris Rubin*** (borisr@math.lsu.edu), Department of Mathematics, Lockett Hall, Louisiana State University, Baton Rouge, LA 70803. *Radon, cosine, and sine transforms on the hyperbolic space.*

Let $\hat{f}(\xi)$ be the k-dimensional totally geodesic Radon transform of a function f on the real hyperbolic space H^n, $1 \le k \le n-1$. We prove that for $f \in L^p(H^n)$, $\hat{f}(\xi)$ exists for almost all k-geodesics ξ if and only if

$$1 \le p < (n-1)/(k-1).$$

New inversion formulas for $\hat{f}(\xi)$ and the relevant cosine and sine transforms on H^n are obtained. (Received February 10, 2006)