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# The spherical transform for homogeneous vector bundles over Riemannian symmetric spaces

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**Abstract.** Let $G/K$ be a Riemannian symmetric space of the noncompact type. For $\tau \in \hat{K}$, let $E^\tau$ be the homogeneous vector bundle over $G/K$ associated with $\tau$, and let $C_0^\infty(G,\tau,\tau)$ be the related convolution algebra of *radial systems of sections* of $E^\tau$. Assuming $C_0^\infty(G,\tau,\tau)$ commutative, we use the theory of spherical functions of type $\tau$ on $G$ to define a spherical transform for $F \in C_0^\infty(G,\tau,\tau)$. The corresponding inversion formula is obtained by using the Plancherel formula on $G$. The example of real hyperbolic spaces $H^N(\mathbb{R})$ is discussed. The Plancherel measure is written down explicitly in this case, and the vector bundles of Dirac spinors, symmetric traceless tensors, and $p$-forms on $H^N(\mathbb{R})$ are considered in detail.

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