Letter to the Editor

Remarks on B. Rubin, “Radon, cosine and sine transforms on real hyperbolic space”

To the Editor:

In [3, p. 222] it is pointed out that the function $\tau$ in my book [2, p. 102, line 4] is not integrable as asserted there and in [1, p. 625, line 8 from below]. As a result the inversion formula in [1, p. 625] and Eq. (60) in [2, p. 101] is not fully justified. In [3, pp. 220–221] the justification is given by analysis based on Young’s inequality and then relying on the Flensted–Koornwinder injectivity theorem for the spherical transform on $L^p(X), 1 \leq p \leq 2$.

The following justification is simpler. In [2, p. 102, line 4], replace $\tau$ with $\tau \varphi_\lambda (\lambda$ real), which is integrable. Thus (62) follows from the proof of (53) on p. 100. Next we deduce $f \times \tau \in L^2(X)$ for $f \in \mathcal{D}(X)$ by decomposing $\tau = \tau_1 + \tau_2$ with $\tau_1 = \tau \varphi$, where $\varphi$ is the characteristic function of a ball $B(0)$. Since $\sigma \in L^1(X)$, we have $f \times \tau \times \sigma \in L^2(X)$, and the inversion formula (60) follows from the Plancherel formula for the spherical transform.

References


Sigurdur Helgason

Department of Mathematics
Massachusetts Institute of Technology
Room 2-182, 77 Massachusetts Avenue
Cambridge, MA 02139, USA
E-mail address: helgason@mit.edu

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