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Artikel: THE REPRESENTATION THEORY OF SL(2, R), A NON-INFINITESIMAL APPROACH

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Kapitel: 6.3. Notes

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on

$$Cl\ \mathrm{Span}\{\phi_{\lambda+\frac{1}{2}}, \phi_{\lambda+3/2}, \ldots\}$$

and

$$Cl\ \mathrm{Span}\{\ldots, \phi_{-\lambda-3/2}, \phi_{-\lambda-\frac{1}{2}}\},$$

respectively, with respect to the inner product

$$<\phi_m, \phi_n> := \frac{(|m| - (\lambda+\frac{1}{2}))!}{(2\lambda+1)_{|m|-(\lambda+\frac{1}{2})}} \delta_{m,n} \ (\textit{discrete series}).$$

4) $\pi^0_{0,\frac{1}{2}}$ *(identity representation).*

6.3. Notes

6.3.1. Following BARGMANN [2], most authors prove Theorem 6.2 by infinitesimal methods. VILENKIN [43, Ch. VI] uses the method of the present paper. TAKAHASHI [39, §6] decides about unitarizability by considering whether $\pi_{\xi,\lambda,n,n}$ is a positive definite function on G.

6.3.2. A method related to this section was used in FLENSTED-JENSEN & KOORNWINDER [15] in order to find all irreducible unitary spherical representations of non-compact semisimple Lie groups G of rank one. They examined the nonnegativity of the coefficients in the addition formula for the spherical functions on G. See also [27, §6.4].

6.3.3. A generalization of Theorem 6.1 can be formulated for not necessarily abelian K and, partly, for K-finite τ, cf. [27, Theorems 6.4, 6.5].