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Sampling in Spaces of Bandlimited Functions on Commutative Spaces

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A connected homogeneous space X=G/K is called commutative if G is a connected Lie group, K is a compact subgroup and the B*-algebra L^1(X)^K of K-invariant integrable function on X is commutative. In this article we introduce the space L^2_A (X) of A-bandlimited function on X by using the spectral decomposition of L^2 (X). We show that those spaces are reproducing kernel Hilbert spaces and determine the reproducing kernel. We then prove sampling results for those spaces using the smoothness of the elements in L^2_A (X). At the end we discuss the example of R^d, the spheres S^d, compact symmetric spaces and the Heisenberg group realized as the commutative space U (n) x H_n/U (n).

Submission history

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