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The Radon transform on Helgason spheres in Hermitian symmetric spaces of compact type

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We consider generalizations of the Radon transform from Euclidean space to symmetric spaces, of compact type. The first example is the celebrated Funk transform, which integrates over great circles on the sphere. These transforms are generally attached to totally geodesic varieties of various types, include maximal flat submanifolds, maximally dimensional, and maximally curved submanifolds. S. Helgason, in a 1966 paper, showed that there are many of the latter, and that they are usually spheres, now called Helgason Spheres. The dimensions and manifestations of these maximally curved spheres vary widely across the realm of symmetric spaces. As a consequence, we do not expect a uniform treatment of Radon transform across all symmetric ambient space. However, if we restrict to symmetric spaces with special additional structure, e.g., Lie groups viewed symmetric spaces, or Hermitian symmetric spaces, then uniformity sets in. Already known is the uniform treatment of injectivity of the Radon transform on Helgason spheres in Lie groups. We provide evidence for a unified treatment of uniqueness and invertibility properties of the Radon transform in the Hermitian context.