

For each of the n -sphere and n -hyperbolic space we consider two versions of positive definiteness, the first defined in terms of its usual metric, and the second based on the natural algebraic (hypergroup) structure arising from its representation as a homogeneous space G/H , where G is the group of its isometries and H is the compact subgroup fixing a distinguished point O . In the case of the sphere the positive definite functions using either definition are just the infinite convex combinations of normalized Gegenbauer (ultraspherical) polynomials. We outline why this is the case and investigate the corresponding relationship for real hyperbolic space.