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Eric L Grinberg* (eric.grinberg@umb.edu), Department of Mathematics, University of Massachusetts Boston, Boston, MA 02125, and **Steven G Jackson** (jackson@math.umb.edu), Department of Mathematics, University of Massachusetts Boston, Boston, MA 02446. *The Flat Torus Transform on Symmetric Spaces of Compact Type*. Preliminary report.

In a 1913 paper Paul Funk proved that a suitable function on the sphere S^2 is odd if and only if its integrals over great circles (closed geodesics) vanish, and that an even function is determined by such integrals. We replace the sphere S^2 by a symmetric space of compact type, e.g., a grassmann manifold, and great circles by maximal totally geodesic flat tori, and consider the transform that integrates over these. We show that, when the symmetric space is the “universal covered space” in its class, the torus transform is injective, and otherwise the transform is non- injective, with a kernel that is directly linked to deck transformations of the appropriate symmetric cover. This gives one of the direct extensions of Funk’s transform and its injectivity properties. (Received January 28, 2014)