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Journal of Lie Theory 27 (2017) 623–636

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**On the Kernel of the Maximal Flat Radon Transform on Symmetric
Spaces of Compact Type**

Let M be a Riemannian globally symmetric space of compact type, M' its set of maximal flat totally geodesic tori, and $\text{Ad}(M)$ its adjoint space. We show that the kernel of the maximal flat Radon transform $\tau: L^2(M) \rightarrow L^2(M')$ is precisely the orthogonal complement of the image of the pullback map $L^2(\text{Ad}(M)) \rightarrow L^2(M)$. In particular, we show that the maximal flat Radon transform is injective if and only if M coincides with its adjoint space.

Keywords: Integral geometry, Radon transform, symmetric space.

MSC: 44A12; 22E30, 22E46, 43A85, 53C35, 53C65