

OSCILLATING MULTIPLIERS ON RANK ONE LOCALLY SYMMETRIC SPACES

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ABSTRACT

Consider the family of convolution operators

$$T_{\alpha,\beta} = (-\Delta)^{-\beta/2} e^{i(-\Delta)^{\alpha/2}}, \quad \alpha \in (0, 1], \quad \beta > 0,$$

on rank one noncompact symmetric spaces $X = G/K$, of dimension n , where Δ is the Laplace-Beltrami operator. A result of Giulini and Meda states that if $p \in (1, \infty)$, then $T_{\alpha,\beta}$ is bounded on $L^p(X)$, provided that one of the following hold: (i) $0 < \alpha < 1$ and $\beta > \alpha n \left| \frac{1}{p} - \frac{1}{2} \right|$, (ii) $\alpha = 1$ and $\beta > (n-1) \left| \frac{1}{p} - \frac{1}{2} \right|$. Let Γ be a discrete and torsion free subgroup of G and let us consider the locally symmetric space $M = \Gamma \backslash X$. For the corresponding operators on M , we prove $L^p(M)$ boundedness under conditions analogous to (i), (ii), on wide classes of rank one locally symmetric spaces.

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