L^p-BOUNDEDNESS OF PSEUDO-DIFFERENTIAL OPERATORS ON SYMMETRIC SPACES OF NONCOMPACT TYPE AND HOMOGENEOUS TREES

TAPENDU RANA

For a given function $a(x, \xi)$ on $\mathbb{R}^n \times \mathbb{R}^n$, consider the pseudo-differential operator $a(x, D)$ defined by

$$a(x, D)f(x) = \int_{\mathbb{R}^n} a(x, \xi)\widehat{f}(\xi)e^{2\pi i x\cdot\xi}d\xi,$$

where $\widehat{f}$ is the Fourier transform of a function f. Let S^0 be the set of all smooth functions $a : \mathbb{R}^n \times \mathbb{R}^n \to \mathbb{C}$ satisfies,

$$\left|\partial_x^\beta \partial_\xi^\alpha a(x, \xi)\right| \leq C_{\alpha,\beta} \left(1 + |\xi|\right)^{-|\alpha|}$$

for all $x, \xi \in \mathbb{R}^n$ and for all multi indices α and β. Then the following result is well known:

Theorem. *For $a \in S^0$, $a(x, D)$ extends to a bounded operator on $L^p(\mathbb{R}^n)$ to itself, for $1 < p < \infty$.*

In this talk, we will discuss analogues of this result on rank one Riemannian symmetric spaces of non-compact type and its discrete version, homogeneous trees. This talk contains collaborative works with Prof. Sanjoy Pusti (IIT Bombay) and Dr. Sumit Kumar Rano (ISI Kolkata).