

# HARDY AND ADAMS TYPE INEQUALITIES FOR THE FRACTIONAL LAPLACE-BELTRAMI OPERATOR ON NONCOMPACT SYMMETRIC SPACES

ABSTRACT. In this talk, we will discuss Hardy and Adams type inequalities for fractional powers of the Laplace-Beltrami operator on Riemannian symmetric space  $X$  of noncompact type. We use solutions to the extension problem in combination with ground state representation method (of Frank et al) to establish Hardy's inequality. We will discuss  $L^p - L^q$  mapping properties of the extension operator and get an improvement over the corresponding results on Euclidean spaces. This is a joint work with Sanjoy Pusti.

Next, we will discuss sharp Adams type inequalities on Sobolev spaces  $W^{\alpha, n/\alpha}(X)$  of any fractional order  $\alpha < n$  on  $X$  with dimension  $n$ .