Ann. Sc. Norm. Super. Pisa Cl. Sci. (5)
Vol. XVI (2016), 981-1017

Nikolskii inequality and Besov, Triebel-Lizorkin, Wiener and Beurling spaces on compact homogeneous manifolds

ERLAN NURSULTANOV, MICHAEL RUZHANSKY AND SERGEY TIKHONOV

Abstract. In this paper we prove Nikolskii's inequality (also known as the reverse Hölder inequality) on general compact Lie groups and on compact homogeneous spaces with the constant interpreted in terms of the eigenvalue counting function of the Laplacian on the space, giving the best constant for certain indices, attained on the Dirichlet kernel. Consequently, we establish embedding theorems between Besov spaces on compact homogeneous spaces, as well as embeddings between Besov spaces and Wiener and Beurling spaces. We also analyse Triebel-Lizorkin spaces and β-versions of Wiener and Beurling spaces and their embeddings, and interpolation properties of all these spaces.

Mathematics Subject Classification (2010): 35G10 (primary); 46F05; 35L30 (secondary).