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On Carleson-type embeddings for weighted harmonic mixed norm spaces

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Abstract. We study weighted mixed norm spaces of harmonic functions defined on smoothly bounded domains in $\mathbb{R}^n$. Our principal result is a characterization of Carleson measures for these spaces. Result in the upper half space $\mathbb{R}^{n+1}_+$ is obtained by Arsenović and Shamoyan in [1]. In 2013, Hu and Lv obtained result for unweighted mixed norm spaces on smoothly bounded domains in $\mathbb{R}^n$ (see [3]). Results of Engliš obtained in 2015, concerning the weighted Bergman kernel (see [2]), enable us to generalize that result by alowing power-type weights. First we obtain an equivalence of norms on these spaces. We use estimates of the weighted Bergman kernel to obtain estimates of its integral means. Then, we estimate norms of test functions which are important in proving our main result. Finally, we give a necessary and sufficient condition for the embedding of the weighted harmonic mixed norm space $B^{p,q}_\alpha(\Omega)$ into $L^{p,q}(\Omega, d\mu)$ where $\alpha > 0$, μ is a Borel measure on Ω and $1 < p, q < \infty$.

Keywords: Carleson measures; mixed norm spaces; embedding theorem.

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