

Littlewood-Paley characterization for Campanato spaces

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(Communicated by Hans Triebel)

2000 Mathematics Subject Classification. 42B25.

Keywords and phrases. Campanato spaces, BMO and bmo , Theorems of Littlewood Paley type.

Abstract. The Littlewood-Paley characterization for the local approximation Campanato spaces L_p^α is well known in the cases $\alpha \geq 0$ and $\alpha = -\frac{n}{p}$. We give in this paper a characterization of such a type for L_2^α spaces (and for Morrey-Campanato spaces $\mathcal{L}^{2,\lambda}$) for any $\alpha \geq -\frac{n}{2}$. These spaces contain as special cases the well known spaces BMO of John and Nirenberg and its local version bmo .

1. Introduction and results

In this paper, we make use of a partition of Littlewood-Paley type to get a dyadic characterization for the spaces BMO , bmo and more generally for Campanato spaces $\mathcal{L}^{2,\lambda}$ modulo polynomials and their local versions L_2^α . In this direction we mention the following classical characterization of BMO and bmo with the aid of Triebel-Lizorkin spaces $F_{p,q}^s(\mathbf{R}^n)$: $BMO = \dot{F}_{\infty,2}^0$, $bmo = F_{\infty,2}^0$ and $I^s(BMO) = \dot{F}_{\infty,2}^s$, where $I^s = \mathcal{F}^{-1}(|\cdot|^{-s}\mathcal{F})$ is the Riesz