cases	doc_1	doc_2	decision	id
	authors: Nguyen Huu Huy Phuc; Monica Torres **title**: Characterizations of signed measures in the dual of BV and related isometric isomorphisms **publication_date**: 2015-03-20 00:00:00 **source**: SupportedSources.OPENALEX **journal**: arXiv (Cornell University) **volume**: **doi**: None **urls**: https://openalex.org/W1812629752 **id**: id1266858253512507843 **abstract**: **versions**:	**authors**: Nguyen Cong Phuc; Monica Torres **title**: Characterizations of signed measures in the dual of BV and related isometric isomorphisms **publication_date**: 2015-03-20 19:54:26+00:00 **source**: SupportedSources.ARXIV **journal**: None **volume**: **doi**: **urls**: http://arxiv.org/pdf/1503.06208v1; http://arxiv.org/abs/1503.06208v1; http://arxiv.org/pdf/1503.06208v1 **id**: id-6350975287158879111 **abstract**: We characterize all (signed) measures in $BV_{\frac{n}{n-1}}(\mathbb{R}^n)^*$, where $BV_{\frac{n}{n-1}}(\mathbb{R}^n)$ is defined as the space of all functions u in $L^{\frac{n}{n-1}}(\mathbb{R}^n)$ such that Du is a finite vector-valued measure. We also show that $BV_{\frac{n}{n-1}}(\mathbb{R}^n)^*$ and $BV(\mathbb{R}^n)^*$ are isometrically isomorphic, where $BV(\mathbb{R}^n)$ is defined as the space of all functions u in $L^{1}(\mathbb{R}^n)$ such that Du is a finite vector-valued measure. As a consequence of our characterizations, an old issue raised in Meyers-Ziemer [MZ] is resolved by constructing a locally integrable function f such that f belongs to $BV(\mathbb{R}^n)^{*}$ but $\|f\|$ does not. Moreover, we show that the measures in $BV_{\frac{n}{n-1}}(\mathbb{R}^n)^*$ coincide with the measures in $\dot W^{1,1}(\mathbb{R}^n)^*$, the dual of the homogeneous Sobolev space $\dot W^{1,1}(\mathbb{R}^n)$, in the sense of isometric isomorphism. For a bounded open set Ω with Lipschitz boundary, we characterize the measures in the dual space $BV_0(\Omega)^*$. One of the goals of this paper is to make precise the definition of $BV_0(\Omega)$, which is the space of functions of bounded variation with zero trace on the boundary of Ω. We show that the measures in $BV_0(\Omega)^*$ coincide with the measures in $W^{1,1}_0(\Omega)^*$. Finally, the class of finite measures in $BV(\Omega)^*$ is also characterized. **versions**:	DUPLICATES	1189