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	title	Sharp singular Adams inequalities in high order Sobolev spaces	**title**	Sharp Adams type inequalities in Sobolev spaces $W^{m,\frac{n}{m}}(\mathbb{R}^{n})$ for arbitrary integer m		
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	id	id2785754343849818854	**id**	id-7143352130776687496		
	abstract	In this paper, we prove a version of weighted inequalities of exponential type for fractional integrals with sharp constants in any domain of finite measure in $\mathbb{R}^{n}$. Using this we prove a sharp singular Adams inequality in high order Sobolev spaces in bounded domain at critical case. Then we prove sharp singular Adams inequalities for high order derivatives on unbounded domains. Our results extend the singular Moser-Trudinger inequalities of first order in \cite{Ad2, R, LR, AdY} to the higher order Sobolev spaces $W^{m,\frac{n}{m}}$ and the results of \cite{RS} on Adams type inequalities in unbounded domains to singular case. Our singular Adams inequality on $W^{2,2}(\mathbb{R}^{4})$ with standard Sobolev norm at the critical case settles a unsolved question remained in \cite{Y}.	**abstract**	The main purpose of our paper is to prove sharp Adams-type inequalities in unbounded domains of $\mathbb{R}^{n}$ for the Sobolev space $W^{m,\frac{n}{m}}\left(\mathbb{R} ^{n}\right)$ for any positive integer m less than n. Our results complement those of Ruf and Sani \cite{RS} where such inequalities are only established for even integer m. Our inequalities are also a generalization of the Adams-type inequalities in the special case $n=2m=4$ proved in \cite{Y} and stronger than those in \cite{RS} when $n=2m$ for all positive integer m by using different Sobolev norms.		
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