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Compact imbedding of weighted Sobolev space defined on an unbounded domain. I. (English)

Zbl 0646.46029

Čas. Pěstování Mat. 113, No. 1, 60-73 (1988).

Let Ω be an unbounded domain in \mathbb{R}^N , then $W^{k,p}(\Omega; S)$ with $1 \leq p < \infty$ and $k \in \mathbb{N}$ is the collection of distributions u such that

$$\left(\sum_{|\alpha| \leq k} \int_{\Omega} |D^{\alpha} u(x)|^p w_{\alpha}(x) dx \right)^{1/p} < \infty,$$

where $S = \{w_{\alpha}\}$ stands for the weight functions. $W_0^{k,p}(\Omega; S)$ denotes the completion of $C_0^{\infty}(\Omega)$ in $W^{k,p}(\Omega; S)$. The aim of the paper is to derive conditions on S and on the weight function ρ such that the natural embedding from $W_0^{k,p}(\Omega; S)$ into $L^p(\Omega; \rho)$ is compact.

Reviewer: [H.Triebel](#)

MSC:

46E35 Sobolev spaces and other spaces of “smooth” functions, embedding theorems, trace theorems

Cited in **1** Review
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Keywords:

weighted Sobolev space defined on an unbounded domain; embedding

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