INTERPOLATION
OF WEIGHTED SOBOLEV SPACES

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In the present article, we describe the spaces $\left(H^m_{p,\Psi}(\Omega),\, L_{p,\omega}(\Omega)\right)_{\theta,p}$, where the norms on $H^m_{p,\Psi}(\Omega)$ and on $L_{p,\omega}(\Omega)$ are defined as follows:

$$\|u\|^p_{H^m_{p,\Psi}(\Omega)} = \int_\Omega \sum_{|\alpha|\le m} \omega_\alpha |D^\alpha u(x)|^p \, dx,$$

$$\|u\|^p_{L_{p,\omega}(\Omega)} = \int_\Omega \omega(x) |u(x)|^p \, dx,$$

with ω_α, ω continuous positive functions on Ω. The results obtained are applicable to studying elliptic eigenvalue problems with an indefinite weight function.

Key words and phrases: interpolation space, weighted Sobolev space, Besov space, Hardy inequality.

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