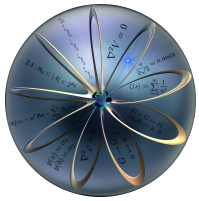

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Rellich selection theorem

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Let D be an open subset of $\mathbb{R}^n$. If, for a sequence of functions $f_i \colon D \to \mathbb{R}$, $i = 1, 2, \ldots$ there exists a constant $B > 0$ such that

$$(\forall i) \qquad \|f_i\|_{L^2(D)} = \int_D f_i^2 \, d^n x < B$$

and

$$(\forall i)\,(\forall j \in \{1, \ldots n\}) \qquad \int_D \left(\frac{\partial f_i}{\partial x_j} \right)^2 d^n x < B$$

then there exists a subsequence which is convergent in the $L^2(D)$ norm.