Colgen, R.

Bemerkungen zur Stetigkeit der Eigenwerte selbstadjungierter Operatoren. (German)

Zbl 0532.47016
Z. Angew. Math. Mech. 62, T275-T276 (1982).

This is a remark to *J. Weidmann*'s result [Integral Equations Oper. Theory 3, 138-142 (1980; Zbl 0476.47008)] on the related problem [cf. *T. Kato*, Perturbation Theory for Linear operators, 2nd Ed. (1976; Zbl 0342.47009), Theorem VIII 3.15]. The author notes: Let T_n, T be bounded selfadjoint operators in a Hilbert space H with spectral resolutions $E_n(\cdot)$, $E(\cdot)$, ad let T_n converge to T strongly. Assume that the negative part T^- of T $(= T^+ + T^-)$ is compact, and that there exists a bounded selfadjoint operator T_0 with compact negative part T_0^- such that $\liminf < (T_n - T_0)f_n, f_n > \geq 0$ for every sequence (f_n) in H with $f_n \to^w 0$. Then $\|E_n(\lambda) - E(\lambda)\| \to 0$ for all negative λ which are not eigenvalues of T. The result is applied to the Dirac operator. Some condition on convergence of V_n to V should be mentioned in Satz 2, e.g., $V_n \to V$ locally in $L^2(\mathbb{R}^3)$ as $n \to \infty$.

Reviewer: T.Ichinose

MSC:

47B25 Linear symmetric and selfadjoint operators (unbounded)
47A10 Spectrum, resolvent
47A55 Perturbation theory of linear operators

Keywords:

eigenvector; continuity of eigenvalues; selfadjoint operator; Dirac operator