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CONVERGENCE OF FUNCTIONS OF SELF-ADJOINT OPERATORS AND APPLICATIONS

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Abstract: The main result (roughly) is that if (H_i) converges weakly to H and if also $f(H_i)$ converges weakly to $f(H)$, for a single strictly convex continuous function f, then (H_i) must converge strongly to H. One application is that if $f(\mathrm{pr}(H)) = \mathrm{pr}(f(H))$, where pr denotes compression to a closed subspace M, then M must be invariant for H. A consequence of this is the verification of a conjecture of Arveson, that Theorem 9.4 of [**Arv**] remains true in the infinite dimensional case. And there are two applications to operator algebras. If h and $f(h)$ are both quasimultipliers, then h must be a multiplier. Also (still roughly stated), if h and $f(h)$ are both in $pA_{\mathrm{sa}}p$, for a closed projection p, then h must be strongly q-continuous on p.

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