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Reduced 1-cohomology and relative (T).

The celebrated theorems of Delorme (1977) and Guichardet (1972) establish the equivalence between property (T) and the vanishing of 1-cohomology, where the coefficients are taken in a unitary representation. In 2000 Shalom proved that the (a priori) weaker condition of the vanishing of reduced 1-cohomology is in fact equivalent to property (T) for the class of compactly generated groups. In 2005-2006 de Cornulier, Jolissaint, and Fernos independently showed that the vanishing of the restriction map on 1-cohomology is equivalent to relative property (T). One may ask if the relative version of Shalom's theorem is true. In a joint work with Valette we exhibit a large class of non-compact amenable group-pairs where the restriction map on reduced 1-cohomology always vanishes. Since amenable groups can not have relative property (T) with respect to non-compact subgroups, our result gives a strong negative answer to the above question. (Received September 23, 2010)