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Convolution operators with empty residual spectrum

Let X be a Banach space on which a discrete group Γ acts by isometries. For certain natural choices of X, every element of the group algebra, when regarded as an operator on X, has empty residual spectrum. This turns out to be the case when X is $\ell^2(\Gamma)$ or the group von Neumann algebra $VN(\Gamma)$, regardless of the choice of group. On the other hand, when $X = \ell^1(\Gamma)$, an example of Willis shows that some condition on Γ is necessary.

In this talk I will discuss some of these results, using the notion of a *surjunctive pair* to try and develop a systematic picture. If time permits I will mention some partial results that can be obtained for $X = \ell^p(\Gamma)$ when Γ is *amenable*; these rely on a majorization result of Herz.