

On some applications of Banach algebra technique

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ABSTRACT. We use a Banach algebra technique to compute the spectral multiplicity of some sets of commuting operators. In particular, we prove the following : Let \mathcal{A} be a unital commutative Banach algebra satisfying the Lin condition, and L be its regular representation. Then $\mu(L \oplus \tau) = 1 + \mu(\tau)$ for any representation τ of \mathcal{A} . Moreover, by using of Banach algebra technique we give a complete description of the set of extended eigenvectors of the Volterra integration operator V , $Vf(x) = \int_0^x f(t) dt$, on $L^2[0, 1]$, which strengthens the result of Biswas, Lambert and Petrovic. We also introduce the concept of a well splitting operator and study its extended eigenvalues and extended eigenvectors.