Isolated points of the extended spectrum of a linear relation

Slaviša Djordjević[1] and Iván Moisés Roque Tlatelpa[1]

[1]Autonomous University of Puebla, Faculty of Physics and Mathematics, slavdj@fcfm.buap.mx, megas.ouranus@gmail.com

In the case of linear operators in a Banach space, the study of isolated points in the spectrum is strongly connected with the theory of generalzied inverses. For example, if zero is an isolated point in the spectrum of a linear bounded operator, its has a generalized Drazin inverse. For a linear relation (multivalued linear operator) in a Banach spaces the direct sum decoposition of it represents a powerful tool for determining the existence of a generalized inverses.

In this talk, we introduce the notions of $R-$invariance and $R-$restriction that is the best way to study the spectral decomposition associated with an isolated points in the spectrum of a linear relation. Our main attention is focused on the study the case when 0 or ∞ are an isolated points in the spectrum of a linear relation or, even more, when there are a pole of the resolvent function.

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