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Grupo de Análise Funcional e Aplicações
Functional Analysis and Applications Group

Quaternionic Volterra operators and P-triangular operators

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Abstract

One of the principal problems in studying spectral theory for quaternionic or Clifford-algebra-valued operators lies in the fact that due to the noncommutativity many methods from classic spectral theory are not working. For instance, even in the simplest case of finite rank operators there are different notions of left and right spectrum. Hereby, the notion of a left spectrum has little practical use while the notion of a right spectrum is based on a nonlinear eigenvalue problem. In the present talk we will introduce the notion of S-spectrum as a natural way to consider a spectrum in a noncommutative setting. We will use it to discuss quaternionic Volterra operators and triangular representations of quaternionic operators similar to the classic approaches by Gohberg, Krein, Livsic, Brodskii, and de Branges. To this end we construct spectral representations of quaternionic operators via integration with respect to quaternionic eigenchains and discuss the concept of P-triangular operators in the quaternionic setting.

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