Fractional semidiscrete evolution equations in Lebesgue sequence spaces

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In this talk, we give representations for solutions of time-fractional differential equations that involve operators on Lebesgue spaces of sequences defined by discrete convolutions involving kernels through the discrete Fourier transform. We consider finite difference operators of first and second orders, which are generators of uniformly continuous semigroups and cosine functions. We present the linear and algebraic structures (in particular, factorization properties) and their norms and spectra in the Lebesgue space of summable sequences. We identify fractional powers of these generators and apply to them the subordination principle. We also give some applications and consequences of our results. These results have been published in a joint paper with Carlos Lizama and Jorge González-Camus from the Universidad de Santiago de Chile.