Applications of the fractional Sturm–Liouville difference problem to the fractional diffusion difference equation

Agnieszka B. Malinowska [1], Tatiana Odzijewicz[2],
Anna Poskrobko[1]

[1] Bialystok University of Technology, Poland

[2] SGH Warsaw School of Economics, Poland

This talk deals with the homogeneous and non-homogeneous fractional diffusion difference equations. The fractional operators in space and time are defined in the sense of Grünwald–Letnikov. Applying results on the existence of eigenvalues and corresponding eigenfunctions of the Sturm–Liouville problem, we show that solutions to fractional diffusion difference equations exist and are given by the finite series.