

Metric Fourier approximation of set-valued functions of bounded variation

Elena Berdysheva

Justus Liebig University Giessen

elena.berdysheva@math.uni-giessen.de

Nira Dyn

Tel-Aviv University

niradyn@tauex.tau.ac.il

Elza Farkhi

Tel-Aviv University

elza@tauex.tau.ac.il

Alona Mokhov

Afeka, Tel-Aviv Academic College of Engineering

alonamok@tauex.tau.ac.il

We study set-valued functions (SVFs) mapping a real interval to compact sets in \mathbb{R}^d . Older approaches to the approximation investigated almost exclusively SVFs with convex images (values), the standard methods suffer from convexification. In this talk I will describe a new construction that adopts the trigonometric Fourier series to set-valued functions with general (not necessarily convex) compact images. Our main result is analogous to the classical Dirichlet-Jordan Theorem for real functions. It states the point-wise convergence in the Hausdorff metric of the metric Fourier partial sums of a multifunction of bounded variation to a set determined by the values of the metric selections of the function. In particular, if the multifunction F is of bounded variation and continuous at a point x , then the metric Fourier partial sums of it at x converge to $F(x)$.