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Fejér and other summation of Walsh-Fourier series

Let x be an element of the unit interval $I := [0, 1)$. The $\mathbb{N} \ni n$th Walsh function is

$$\omega_n(x) := (-1)^{\sum_{k=0}^{\infty} n_k x_k} \quad (n = \sum_{k=0}^{\infty} k_i 2^i,\ x = \sum_{k=0}^{\infty} \frac{x_i}{2^{i+1}}).$$

Define the nth Walsh-Fourier coefficient, the n-th partial sum of the Fourier series of the integrable function f as:

$$\hat{f}(n) := \int_0^1 f(x)\omega_n(x)dx, \quad S_n f(x) := \sum_{k=0}^{n-1} \hat{f}(k)\omega_k(x).$$

Define the Fejér means of the Walsh-Fourier series of f as the arithmetical means of the partial sums. In this talk we give a short resume of some recent results of summation theory of one and two-dimensional Walsh-Fourier series with respect to Fejér, Cesàro, Marcinkiewicz, triangular and other generalized methods. With a special look to almost everywhere convergence and divergence.