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Linear functional equations

(joint work with Miklós Laczkovich)

We investigate the structure of the solutions of the equation

$$\sum_{i=1}^n a_i f(x + b_i y) = 0 \quad (x, y \in \mathbb{C})$$

and formulate some general conjectures concerning the solutions. In some special cases we describe every solution of the equation. Our method is to apply the theory of spectral synthesis and analysis on discrete Abelian groups.