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Integro-differential-difference equations associated with the
Dunkl operator and entire functions

Abstract: In this work we consider the Dunkl operator on the complex plane, defined by

$$\mathcal{D}_k f(z) = \frac{d}{dz} f(z) + k \frac{f(z) - f(-z)}{z}, k \geq 0.$$

We define a convolution product associated with $\mathcal{D}_k$ denoted $*_k$ and we study the integro-differential-difference equations of the type $\mu *_k f = \sum_{n=0}^{\infty} a_{n,k} \mathcal{D}_k^n f$, where $(a_{n,k})$ is a sequence of complex numbers and μ is a measure over the real line. We show that many of these equations provide representations for particular classes of entire functions of exponential type.