

## On a functional equation for the Euler series

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### Abstract

We study a convolution for formal Laurent series and its applications. One of these is a functional equation that completely characterizes the

considered by Euler power series  $f_a(z) = \sum_{n=0}^{\infty} \frac{a_n n!}{z^{n+1}}$ :

$$(a - b)f_a * f_b(z) = af_a(z) - bf_b(z).$$

A convolution representation of a differential operator of infinite order in the space of formal Laurent series is another application.

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