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## On the Combinatorial Content of One-sided Lévy Stable Probability Distributions

We report on recent findings of exact and explicit expressions for one-sided, heavy-tailed Lévy stable probability distributions $g_\alpha(x)$, $0 < x < \infty$, of index $\alpha$, $0 < \alpha < 1$, for all $\alpha = l/k$, with $k$ and $l$ positive integers. We shall exemplify analytically and graphically several examples of known and new cases of such distributions. We point out that $g_{l/k}(x)$ is a solution of a *negative-power* Stieltjes type moment problem of the form $\int_0^\infty x^{-ln} g_{l/k}(x) dx = \frac{(kn)!}{(ln)!}$, $n = 0, 1, \ldots$, i.e. with negative moments being integer combinatorial sequences of factorial type. This last relation, when seen as a conventional Stieltjes moment problem, can be solved with the use of inverse Mellin transform. In this way we derive an explicit formulae for $g_{l/k}(x)$ in terms of Meijer $G$ functions. The problem of non-uniqueness of so obtained solutions is briefly discussed.

This is joint work with Karol A. Penson.

### References

[1] K. A. Penson, K. Górska, arXiv:1007.0193