AN ASYMPTOTIC DISTRIBUTION THEORY FOR EULERIAN RECURRENCES WITH APPLICATIONS

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A class of recurrences of Eulerian type is examined from the viewpoint of asymptotic distribution of the coefficients. We characterize various limit laws of the coefficients using the method of moments and analytic combinatorial tools under general conditions, and apply our results to more than 500 concrete examples that we collected from the literature and from Sloanes OEIS (Online Encyclopedia of Integer Sequences). The limit laws we worked out include normal, half-normal, Rayleigh, beta, Poisson, negative binomial, Mittag-Leffler, Bernoulli, etc., showing the richness and diversity of such a simple framework.