

This is a review submitted to Mathematical Reviews/MathSciNet.

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Author: Denisov, Denis; Wachtel, Vitali

Title: Ordered random walks with heavy tails.

MR Number: MR2878783

Primary classification:

Secondary classification(s):

Review text:

The paper is a continuation of a series of papers studying k i.i.d. real-valued random walks conditional on remaining ordered at all times. It is called “ordered random walk”. This process was considered by Eichelsbacher and König (2008) as a discrete-time analog of Dyson’s Brownian motion (1962), and was shown that, under high moment conditions, the ordered random walk can be constructed by means of a positive harmonic function and Doob’s h -transform. The moment assumptions were improved (in an optimal fashion) by Denisov and Wachtel (2010). In the present paper, the problem of constructing an ordered random walk when these moment conditions fail is considered. Since Doob’s h -transform method appears not to be applicable, the authors have to use a different construction which forces them to enlarge the state space including points at infinity. In addition, the limiting process (through a functional central limit theorem) is not a Dyson Brownian motion, albeit related to it.

Bibliography used in this review.

- Denisov, Denis and Wachtel, Vitali. Conditional limit theorems for ordered random walks. *Electron. J. Probab.* **15** (2010), no. 11, 292-322.
- Dyson, Freeman J. A Brownian-motion model for the eigenvalues of a random matrix. *J. Mathematical Phys.* **3** (1962), 1191-1198.
- Eichelsbacher, Peter and König, Wolfgang. Ordered random walks. *Electron. J. Probab.* **13** (2008), no. 46, 1307-1336.