This is a review submitted to Mathematical Reviews/MathSciNet.

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Title: Some limit theorems for heights of random walks on a spider.

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Review text:

Consider N half-lines ("legs of a spider") in the plane emanating from the origin, and perform a random walk (RW) by letting it behave like a simple symmetric random walk on each leg while choosing a leg uniformly at random whenever it reaches the origin. This is the spider walk. The corresponding distributional limit is the spider Brownian motion (BM), easily constructed by patching together N Brownian excursions. Similar processes have been considered in the past: Walsh's Brownian motion (BM starts from 0, picks a random direction, and performs an excursion in the line with the chosen direction); skew Brownian motion (corresponding to $N = 2$); the spider BM has been suggested in papers by Barlow, Pitman and Yor and by Evans and Sowers. The paper under review provides a number of results for the spider RW and BM. Both processes can be constructed on the same probability space so that a strong approximation result holds. The transition probabilities of the spider RW are expressed in terms of transition probabilities of simple random walk. A local central limit theorem holds. Law of iterated logarithm results are proven for various quantities such as the largest distance of the spider RW from the origin up to a certain time. While there is no attempt to say what the limiting object is when the number of legs N tends to infinity, a number of detailed results are provided. One of them concerns the probability that, in n steps, the walk will have visited all legs or that it have covered distance L in all legs. The classical strong result of Erdős and Rényi concerning the behavior of urn occupancy enters the proof naturally.