LOGARITHMIC FLUCTUATIONS FROM CIRCULARITY

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Start with n particles at the origin in the square grid $\mathbb{Z}^2$, and let each particle in turn perform simple random walk until reaching an unoccupied site. Lawler, Bramson and Griffeath proved that with high probability the resulting random set of n occupied sites is close to a disk. We show that its fluctuations from circularity are, with high probability, at most logarithmic in the radius of the disk, answering a question posed by Lawler in 1995. These logarithmic fluctuations were predicted numerically by chemical physicists in the 1980's.

Joint work with David Jerison and Scott Sheffield.