

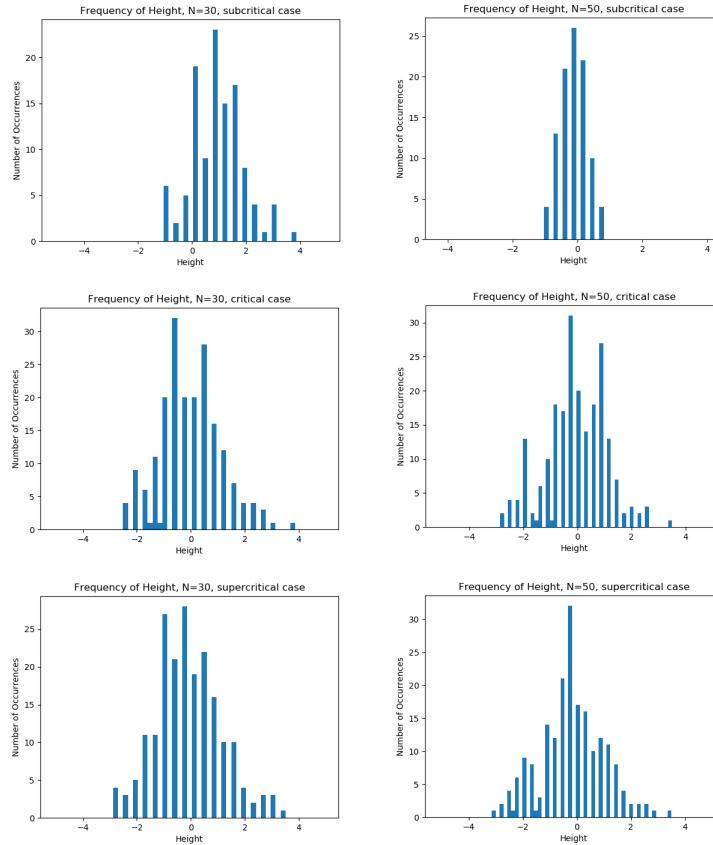
# ASEP Simulation Results

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## 1 Scaling Limits

Simulations of the dynamic ASEP were run at subcritical, critical, and supercritical conditions for  $N = \frac{1}{\varepsilon} = 30$  and 50. Here are the single point distributions for each trial:

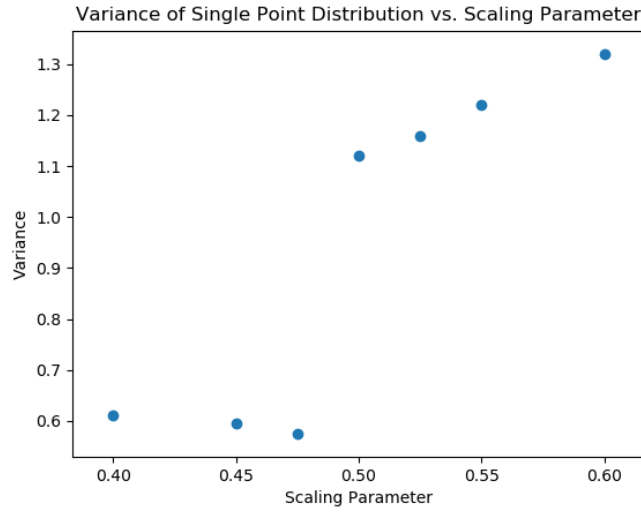


In the subcritical case, the variance of the distribution decreases significantly

(from about 1.1 to about 0.4), while in the other two cases there is no notable change in variance between the two trials. Therefore, we can conclude that the scaling limit is zero in the subcritical case, and nonzero in the other two cases.

## 2 Variance as a Function of Scaling Parameter

For various values of the scaling parameter  $\beta$ , the variance of the single point distribution was measured for fixed  $N$ . Here are the results:



There is a clear jump at the critical point, due to the fact that the subcritical case tends to 0 as  $\varepsilon$  decreases. The slight decrease in variance in the subcritical case may just be random fluctuations due to sample size. Otherwise, it appears that the variance increases with the scaling parameter supercritically (as expected from the nature of the process).