So Ivan had predicted that we could extract $\mathbf{Var}(\tilde{h}^{KPZ}(0,s))$ from the relation:

$$\mathbf{Var}(\tilde{h}^{KPZ}(0,s)) \approx \frac{s}{\log(N)}\mathbf{var}(Q_B(N, \frac{\log(N)^2}{s})) \tag{1}$$

where $s = \frac{\log(N)}{t}$ and $Q_B(N,t)$ is the position of the Nth quantile at time t. A graph of $\mathbf{Var}(\tilde{h}^{KPZ}(0,s))$ is shown below as the blue triangles. I think the key feature is that it's monotonically decreasing and as $t \to \infty$ it approaches a value between 0.5 and 1.

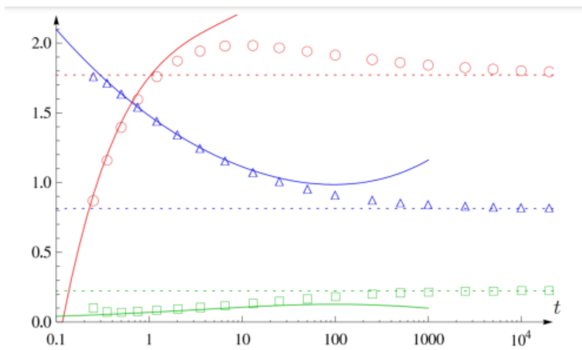

FIG. 3: (Color online) First three normalized cumulants of the distribution F_t as a function of t. Short time expansion of $-C_1$ (solid red line), C_2 (solid blue line), and $C_3/C_2^{3/2}$ (solid green line) as in (24) and numerical evaluation of the cumulants $-C_1$ (red circles), C_2 (blue triangles), $C_3/C_2^{3/2}$ (green squares) for the values of t as listed in (19). The dotted lines represent the asymptotic Tracy-Widom values (27) – (29).

Figure 1: Variance of $\tilde{h}^{KPZ}$ is the blue triangles.

We'd like to plot the right side of Equation 1 as a function of s; however, the issue is we have only recorded $\mathbf{var}(Q_B(N,t)$ as a function of time so we need to transform this to match Equation 1. So we'd like to plot:

$$\frac{s}{\log(N)}\mathbf{var}(Q_B(N, \frac{\log(N)^2}{s})) \text{ vs. } s \tag{2}$$

If we plug in s we get

$$\frac{t}{\log(N)^3}\mathbf{var}(Q_B(N, \frac{\log(N)^4}{t})) \text{ vs. } \frac{t}{\log(N)^2} \tag{3}$$

My thought was to transform this so that on the LHS we have $\mathbf{var}(Q_B(N,t'))$. I began by substituting in $t' = \frac{\log(N)^4}{t}$ so we get

$$\frac{\log(N)}{t'}\mathbf{var}(Q_B(N,t')) \text{ vs. } \frac{\log(N)^2}{t'} \tag{4}$$

Now my assumption was that plotting Equation 4 would be the same as Equation 1 which should give us the points in Figure 1. When I did this I got the figure below which doesn't look like the curve in Figure 1 at any times.

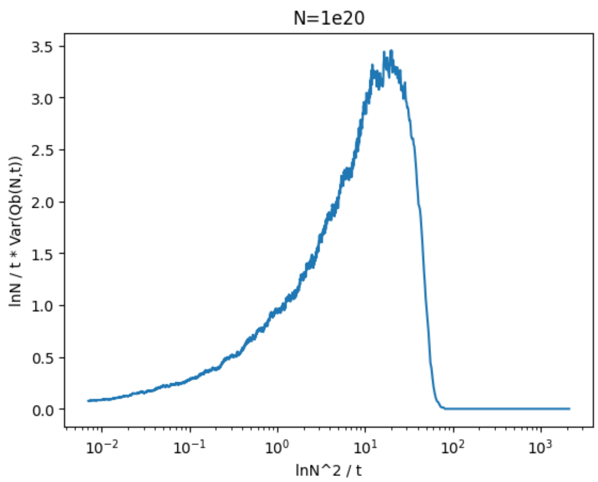

Figure 2: Calculated curve for $\tilde{h}^{KPZ}(0,s)$

The figure was generated using the PDF for 1000 systems out to t=300,000 and for the 1e20 quantile.