Algorithm

1. Calculate $\gamma(k) = \frac{\sigma_\eta^2}{1-a_1^2} \cdot a_1^{|k|}$.
2. Calculate $\text{Var}(\bar{Y}) = \frac{\gamma(0)}{T} + \frac{2}{T}\sum_{k=1}^{T-1}(1-\frac{k}{T})\gamma(k)$.
3. Calculate $T^* = \frac{\gamma(0)}{\text{Var}(\bar{Y})}$.
4. For each location $i = 1/T, 2/T, \dots, 1$ and each bandwidth $h = 3/T, 8/T, \dots, 1/4 + 3/T$ we calculate the following values:
   - $ESS(i,h) = \frac{\frac{1}{h}\sum_{t=1}^{T} K\left(\frac{i-t/T}{h}\right)}{\frac{1}{h}K(0)}$;
   - $ESS^*(i,h) = \frac{T^*}{T} \cdot ESS$;
   - $l(i,h) = \frac{T}{ESS^*(i,h)}$;
   - $q(i,h) = \Phi^{-1}\left(\frac{1+(1-\alpha)^{\frac{1}{l(i,h)}}}{2}\right)$;
   - $(X^T W X)^{-1} X^T W$, where $W = \{diag(\frac{1}{h}K(\frac{i-t/T}{h}))\}$ and
   $$X = \begin{pmatrix} 1 & (1/T - i) \\ 1 & (2/T - i) \\ \vdots & \vdots \\ 1 & (1-i) \end{pmatrix}; \tag{1}$$
   - $sd(\widehat{m}'_h(i)) = \sqrt{((X^T W X)^{-1}(X^T \Sigma X)(X^T W X)^{-1})_{2,2}}$, where Σ is the kernel weighted covariance matrix of errors with generic element
   $$\sigma_{kl} = \gamma(|k-l|)\frac{1}{h}K\Big(\frac{i-k/T}{h}\Big)\frac{1}{h}K\Big(\frac{i-l/T}{h}\Big).$$
5. Discard all pairs of location and bandwidth (i,h) where $ESS^* < 5$.
6. Based on the grid from 5, calculate Gaussian quanitle for our method.