$$\mathcal{H}_{2g+2,q} = \{ Q \in \mathbb{F}_q[T],\ \text{monic},\ \deg Q = 2g+2,\ \text{sq.-free} \}$$

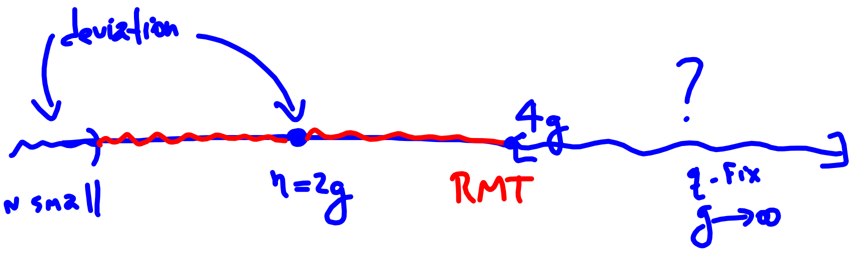
D. Hayes, "Additive Number Theory for Polynomials over Finite Fields" OUP

$C_D / \mathbb{F}_q \qquad C : y^2 = D(x)$

$D \in \mathcal{H}_{2g+1,q}$

$$Z_{C_D}(u) = \frac{P_{C_D}(u)}{(1-u)(1-qu)}$$

$$P_{C_D}(u) = \det(I - \sqrt{q}\, u\, \Theta_{C_D})$$



$\langle \operatorname{tr} \Theta^{n} \rangle$. $n > 4g$

$U(N)$, $SO^{+-}(N)$, $USp(2N)$

$$\frac{1}{\#\mathcal{H}} \sum_{\substack{D \in \mathcal{H} \\ f \neq \square}} \chi_D(f) \ll \frac{2^{\deg(f)}}{q^{g+1}}$$

$$\left| \sum_{\substack{P \text{ monic} \\ \text{irred}}} \chi_P(f) \right|$$

$$\sum_{Q \in \mathcal{H}_{O_7 g+1}} L(1/2, \chi_Q)^K \sim$$