

$$N = 267 = 3 \cdot 89$$

By the Ibukiyama-Kitayama dimension formula,
 $\dim(S_4(K(267))) = 155$

By the Skoruppa-Zagier dimension formula and Jacobi restriction,
the lift dimension of $S_4(K(267))^+$ is 50
the nonlift dimension of $S_4(K(267))^+$ is heuristically 80
 $\dim(S_4(K(267))^+)$ thus is heuristically 130
 $\dim(S_4(K(267))^-)$ is heuristically 25

$\dim(J_{\{2,267\}}^{\{\text{cusp}\}}) = 7$ (Skoruppa-Zagier), so need to span to within 6 dimensions

$q = 5$ for TraceDown

After TD($\text{Grit}(J_{\{4,1335\}}^{\{\text{cusp}\}})$) and $(\text{Grit}(J_{\{2,267\}}^{\{\text{cusp}\}}))^2$,
spanned rank in $S_4(K(267))^+$ is 130
spanned rank in $S_4(K(267))^-$ is 0

Hecke operators applied: $\{\{3, 2\}\}$
After Hecke spreading,
spanned rank in $S_4(K(267))^-$ is 8

After Borcherds products,
spanned rank in $S_4(K(267))^-$ is 19

Final spanned rank in $S_4(K(267))^+$ is 130

Final spanned rank in $S_4(K(267))^-$ is 19

 $S_2(K(267))^+$ is determined by Jacobi restriction and the $H4Ndl(3,+)$ test
($\dim(H_4(267,3,1)^+) \leq 6$ and this is less than $\dim(J_{\{2,267\}}^{\{\text{cusp}\}})+1 = 8$)
 $S_2(K(267))^- = 0$ by Jacobi restriction and the $H4Ndl(1,-)$ test
($\dim(H_4(267,1,1)^-) \leq 6$ and this is less than $\dim(J_{\{2,267\}}^{\{\text{cusp}\}}) = 7$)

So $S_2(K(267)) = \text{Grit}(J_{\{2,267\}}^{\{\text{cusp}\}})$ (dimension 7)