

$$N = 286 = 2 \cdot 11 \cdot 13$$

By the Ibukiyama-Kitayama dimension formula,
 $\dim(S_4(K(286))) = 189$

By the Skoruppa-Zagier dimension formula and Jacobi restriction,
the lift dimension of $S_4(K(286))^+$ is 48
the nonlift dimension of $S_4(K(286))^+$ is heuristically 113
 $\dim(S_4(K(286))^+)$ thus is heuristically 161
 $\dim(S_4(K(286))^-)$ is heuristically 28

$\dim(J_{\{2,286\}}^{\{\text{cusp}\}}) = 3$ (Skoruppa-Zagier), so need to span to within 2 dimensions

$q = 5$ for TraceDown

After TD($\text{Grit}(J_{\{4,1430\}}^{\{\text{cusp}\}})$) and $(\text{Grit}(J_{\{2,286\}}^{\{\text{cusp}\}}))^2$,
spanned rank in $S_4(K(286))^+$ is 157
spanned rank in $S_4(K(286))^-$ is 0

Hecke operators applied: $\{\{2, 2\}, \{2, 2\}, \{2, 1\}\}$
After Hecke spreading,
spanned rank in $S_4(K(286))^-$ is 8

After Borcherds products,
spanned rank in $S_4(K(286))^+$ is 161
spanned rank in $S_4(K(286))^-$ is 27

Final spanned rank in $S_4(K(286))^+$ is 161

Final spanned rank in $S_4(K(286))^-$ is 27

 $S_2(K(286))^+$ is determined by Jacobi restriction and the $H4Ndl(3,+)$ test
($\dim(H_4(286,3,1))^+ \leq 2$ and this is less than $\dim(J_{\{2,286\}}^{\{\text{cusp}\}})+1 = 4$)
 $S_2(K(286))^- = 0$ by Jacobi restriction and the $H4Ndl(1,-)$ test
($\dim(H_4(286,1,1))^- \leq 1$ and this is less than $\dim(J_{\{2,286\}}^{\{\text{cusp}\}}) = 3$)

So $S_2(K(286)) = \text{Grit}(J_{\{2,286\}}^{\{\text{cusp}\}})$ (dimension 3)