

$$N = 102 = 2 \cdot 3 \cdot 17$$

By the Ibukiyama-Kitayama dimension formula,
 $\dim(S_4(K(102))) = 26$

By the Skoruppa-Zagier dimension formula and Jacobi restriction,
the lift dimension of $S_4(K(102))^+$ is 15
the nonlift dimension of $S_4(K(102))^+$ is heuristically 9
 $\dim(S_4(K(102))^+)$ thus is heuristically 24
 $\dim(S_4(K(102))^-)$ is heuristically 2

The heuristic dimensions are correct by the spanning results to follow

$\dim(J_{\{2,102\}}^{\{\text{cusp}\}}) = 1$ (Skoruppa-Zagier), so need to span completely

$q = 7$ for TraceDown

After TD($\text{Grit}(J_{\{4,714\}}^{\{\text{cusp}\}})$) and $(\text{Grit}(J_{\{2,102\}}^{\{\text{cusp}\}}))^2$,
spanned rank in $S_4(K(102))^+$ is 24
spanned rank in $S_4(K(102))^-$ is 0

Hecke operators applied: $\{\{3, 2\}\}$

After Hecke spreading,
spanned rank in $S_4(K(102))^-$ is 1

After Borcherds products,
spanned rank in $S_4(K(102))^-$ is 2

Final spanned rank in $S_4(K(102))^+$ is 24

Final spanned rank in $S_4(K(102))^-$ is 2

 $S_2(K(102))^+$ is determined by Jacobi restriction and the $H4Nd1(1,+)$ test
($\dim(H_4(102,1,1)^+) \leq 1$ and this is less than $\dim(J_{\{2,102\}}^{\{\text{cusp}\}})+1 = 2$)
 $S_2(K(102))^- = 0$ by Jacobi restriction and the $H4Nd1(1,-)$ test
($\dim(H_4(102,1,1)^-) \leq 0$ and this is less than $\dim(J_{\{2,102\}}^{\{\text{cusp}\}}) = 1$)

So $S_2(K(102)) = \text{Grit}(J_{\{2,102\}}^{\{\text{cusp}\}})$ (dimension 1)