

$N = 205 = 5 \cdot 41$

By the Ibukiyama-Kitayama dimension formula,
 $\dim(S_4(K(205))) = 103$

By the Skoruppa-Zagier dimension formula and Jacobi restriction,
the lift dimension of $S_4(K(205))^+$ is 38
the nonlift dimension of $S_4(K(205))^+$ is heuristically 59
 $\dim(S_4(K(205))^+)$ thus is heuristically 97
 $\dim(S_4(K(205))^-)$ is heuristically 6

The heuristic dimensions are correct by the spanning results to follow

$\dim(J_{\{2,205\}}^{\{\text{cusp}\}}) = 5$ (Skoruppa-Zagier), so need to span to within 4 dimensions

$q = 3$ for TraceDown

After TD($\text{Grit}(J_{\{4,615\}}^{\{\text{cusp}\}})$) and ($\text{Grit}(J_{\{2,205\}}^{\{\text{cusp}\}})^2$),
spanned rank in $S_4(K(205))^+$ is 94
spanned rank in $S_4(K(205))^-$ is 0

Hecke operators applied: $\{\{2, 1\}\}, \{\{3, 1\}\}, \{\{2, 2\}\}, \{\{2, 1\}, \{2, 1\}\}, \{\{5, 1\}\},$
 $\{\{3, 1\}, \{2, 1\}\}, \{\{7, 1\}\}, \{\{2, 3\}\}, \{\{2, 2\}, \{2, 1\}\}, \{\{2, 1\}, \{2, 1\}, \{2,$
 $1\}\}, \{\{3, 2\}\}, \{\{3, 1\}, \{3, 1\}\}, \{\{5, 1\}, \{2, 1\}\}, \{\{11, 1\}\}, \{\{2, 2\}, \{3, 1\}\},$
 $\{\{3, 1\}, \{2, 1\}, \{2, 1\}\}, \{\{13, 1\}\}, \{\{7, 1\}, \{2, 1\}\}, \{\{5, 1\}, \{3, 1\}\}, \{\{2,$
 $4\}\}, \{\{2, 3\}, \{2, 1\}\}, \{\{2, 2\}, \{2, 2\}\}, \{\{2, 2\}, \{2, 1\}, \{2, 1\}\}, \{\{2, 1\},$
 $\{2, 1\}, \{2, 1\}\}, \{\{17, 1\}\}, \{\{3, 2\}, \{2, 1\}\}, \{\{3, 1\}, \{3, 1\}, \{2, 1\}\}$

After Hecke spreading,
spanned rank in $S_4(K(205))^+$ is 97

After Borcherds products,
spanned rank in $S_4(K(205))^-$ is 6

Final spanned rank in $S_4(K(205))^+$ is 97

Final spanned rank in $S_4(K(205))^-$ is 6

 $S_2(K(205))^+$ is determined by Jacobi restriction and the $H4Ndl(2,+)$ test

$(\dim(H_4(205,2,1)^+)) \leq 4$ and this is less than $\dim(J_{\{2,205\}}^{\{\text{cusp}\}})+1 = 6$

$S_2(K(205))^- = 0$ by Jacobi restriction and the $H4Ndl(1,-)$ test

$(\dim(H_4(205,1,1)^-)) \leq 0$ and this is less than $\dim(J_{\{2,205\}}^{\{\text{cusp}\}}) = 5$

So $S_2(K(205)) = \text{Grit}(J_{\{2,205\}}^{\{\text{cusp}\}})$ (dimension 5)