

$$N = 115 = 5 \cdot 23$$

By the Ibukiyama-Kitayama dimension formula,
 $\dim(S_4(K(115))) = 36$

By the Skoruppa-Zagier dimension formula and Jacobi restriction,
the lift dimension of $S_4(K(115))^+$ is 20
the nonlift dimension of $S_4(K(115))^+$ is heuristically 15
 $\dim(S_4(K(115))^+)$ thus is heuristically 35
 $\dim(S_4(K(115))^-)$ is heuristically 1

The heuristic dimensions are correct by the spanning results to follow

$\dim(J_{\{2,115\}}^{\{\text{cusp}\}}) = 2$ (Skoruppa-Zagier), so need to span to within 1 dimension

$q = 7$ for TraceDown

After TD($\text{Grit}(J_{\{4,805\}}^{\{\text{cusp}\}})$) and $(\text{Grit}(J_{\{2,115\}}^{\{\text{cusp}\}}))^2$,
spanned rank in $S_4(K(115))^+$ is 35
spanned rank in $S_4(K(115))^-$ is 0

After Borcherds products,
spanned rank in $S_4(K(115))^-$ is 1

Final spanned rank in $S_4(K(115))^+$ is 35

Final spanned rank in $S_4(K(115))^-$ is 1

$S_2(K(115))$ is determined by Jacobi restriction and the $H4Ndd(2,+)$ test
($H_4(115,2,2)^+ = 0$)

So $S_2(K(115)) = \text{Grit}(J_{\{2,115\}}^{\{\text{cusp}\}})$ (dimension 2)