

$$N = 110 = 2 \cdot 5 \cdot 11$$

By the Ibukiyama-Kitayama dimension formula,  
 $\dim(S_4(K(110))) = 28$

By the Skoruppa-Zagier dimension formula and Jacobi restriction,  
the lift dimension of  $S_4(K(110))^+$  is 15  
the nonlift dimension of  $S_4(K(110))^+$  is heuristically 10  
 $\dim(S_4(K(110))^+)$  thus is heuristically 25  
 $\dim(S_4(K(110))^-)$  is heuristically 3

The heuristic dimensions are correct by the spanning results to follow

$\dim(J_{\{2,110\}}^{\{\text{cusp}\}}) = 0$  (Skoruppa-Zagier), so need to span completely

$q = 13$  for TraceDown

After TD( $\text{Grit}(J_{\{4,1430\}}^{\{\text{cusp}\}})$ ) and  $(\text{Grit}(J_{\{2,110\}}^{\{\text{cusp}\}}))^2$ ,  
spanned rank in  $S_4(K(110))^+$  is 25  
spanned rank in  $S_4(K(110))^-$  is 0

After Borcherds products,  
spanned rank in  $S_4(K(110))^-$  is 3

Final spanned rank in  $S_4(K(110))^+$  is 25

Final spanned rank in  $S_4(K(110))^-$  is 3

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$S_2(K(110))$  is determined by Jacobi restriction and the  $H4Ndd(1,+)$  test  
( $H_4(110,1,1)^+ = 0$ )

So  $S_2(K(110)) = \text{Grit}(J_{\{2,110\}}^{\{\text{cusp}\}})$  (dimension 0)