

Groups of the form $SL_2(\mathbb{F}_{2^r})$ as Galois groups over \mathbb{Q}

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Abstract

The following groups appear as Galois groups over \mathbb{Q} . Every set below corresponds to a field extension with the indicated group with no prime outside the set ramified. The associated Galois representations are all modular in the sense that they come from some Katz modular form of characteristic two, weight one or two, for an odd level. According to Serre's ϵ -conjecture, none of the given primes ought to be unramified and hence all of the fields ought to be distinct.

$SL_2(\mathbb{F}_{2^2})$:

{653}, {1061}, {1381}, {1553}, {1733}, {2029}, {2053}, {2083}, {2293}, {2609}, {2707}, {2777},
{2861}, {3089}, {3203}, {3329}, {2, 5}, {2, 17}, {2, 19}, {2, 29}, {2, 31}, {2, 43}, {2, 67}, {2, 73},
{2, 103}, {2, 107}, {2, 167}, {2, 191}, {2, 193}, {2, 211}, {2, 307}, {2, 313}, {2, 331}, {2, 347},
{2, 353}, {2, 383}, {2, 401}, {2, 409}, {2, 457}, {2, 461}, {2, 487}, {2, 491}, {2, 499}, {2, 509},
{2, 523}, {2, 577}, {2, 593}, {2, 599}, {2, 619}, {2, 647}, {2, 677}, {2, 709}, {2, 727}, {2, 751},
{2, 761}, {2, 773}, {2, 809}, {2, 877}, {2, 887}, {2, 919}, {2, 929}, {2, 937}, {2, 1063}, {2, 1069},
{2, 1103}, {2, 1171}, {2, 1181}, {2, 1217}, {2, 1229}, {2, 1283}, {2, 1303}, {2, 1361}, {2, 1459},
{2, 1531}, {2, 1567}, {2, 1607}, {2, 1609}, {2, 1619}, {2, 1657}, {2, 1663}, {2, 1693}, {2, 1811},
{2, 1823}, {2, 1831}, {2, 1867}, {2, 1871}, {2, 1913}, {2, 1931}, {2, 1951}, {2, 1979}, {2, 1987},
{2, 1999}, {2, 2017}, {2, 2039}, {2, 2063}, {2, 2081}, {2, 2089}, {2, 2137}, {2, 2179}, {2, 2207},
{2, 2213}, {2, 2221}, {2, 2243}, {2, 2251}, {2, 2269}, {2, 2287}, {2, 2297}, {2, 2339}, {2, 2351},
{2, 2357}, {2, 2381}, {2, 2417}, {2, 2441}, {2, 2447}, {2, 2467}, {2, 2477}, {2, 2521}, {2, 2531},
{2, 2539}, {2, 2543}, {2, 2579}, {2, 2617}, {2, 2633}, {2, 2657}, {2, 2687}, {2, 2693}, {2, 2711},
{2, 2753}, {2, 2851}, {2, 2857}, {2, 2939}, {2, 2963}, {2, 2999}, {2, 3001}, {2, 3019}, {2, 3023},
{2, 3049}, {2, 3083}, {2, 3119}, {2, 3217}, {2, 3229}, {2, 3259}, {2, 3271}, {2, 3301}, {2, 3307},
{2, 3313}, {2, 3413}, {2, 3433}, {3, 67}, {5, 13}, {5, 89}, {7, 409}, {7, 461}, {7, 467}, {11, 137},
{11, 251}, {13, 173}, {17, 157}, {19, 139}, {23, 127}, {29, 89}, {37, 61}, {41, 73}, {2, 3, 11}, {2, 3, 13},
{2, 3, 23}, {2, 3, 41}, {2, 3, 59}, {2, 3, 61}, {2, 3, 71}, {2, 3, 79}, {2, 3, 97}, {2, 3, 109}, {2, 3, 139},
{2, 3, 151}, {2, 3, 157}, {2, 3, 223}, {2, 3, 281}, {2, 3, 317}, {2, 3, 359}, {2, 3, 449}, {2, 3, 479},
{2, 3, 547}, {2, 3, 631}, {2, 3, 641}, {2, 3, 661}, {2, 3, 733}, {2, 3, 827}, {2, 3, 839}, {2, 3, 857},
{2, 3, 971}, {2, 3, 983}, {2, 3, 991}, {2, 3, 997}, {2, 3, 1009}, {2, 3, 1021}, {2, 3, 1087}, {2, 3, 1109},
{2, 7, 11}, {2, 7, 13}, {2, 7, 41}, {2, 7, 47}, {2, 7, 53}, {2, 7, 101}, {2, 7, 149}, {2, 7, 151}, {2, 7, 163},
{2, 7, 223}, {2, 7, 241}, {2, 7, 257}, {2, 7, 349}, {2, 7, 419}, {2, 7, 433}, {2, 7, 443}, {2, 11, 23},
{2, 11, 71}, {2, 11, 101}, {2, 11, 139}, {2, 11, 263}, {2, 11, 311}, {2, 13, 23}, {2, 13, 89}, {2, 13, 109},

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{2, 13, 151}, {2, 13, 157}, {2, 13, 223}, {2, 13, 233}, {2, 13, 257}, {2, 23, 113}, {2, 23, 149}, {2, 37, 47},
{2, 37, 53}, {2, 37, 83}, {2, 37, 89}

SL₂(F₂₃):

{1429}, {1567}, {1613}, {1693}, {1997}, {2017}, {2089}, {2879}, {2, 3}, {2, 7}, {2, 13}, {2, 17},
{2, 19}, {2, 37}, {2, 41}, {2, 43}, {2, 47}, {2, 53}, {2, 97}, {2, 109}, {2, 113}, {2, 127}, {2, 139},
{2, 149}, {2, 151}, {2, 179}, {2, 211}, {2, 227}, {2, 239}, {2, 359}, {2, 397}, {2, 449}, {2, 461},
{2, 587}, {2, 641}, {2, 739}, {2, 809}, {2, 911}, {2, 1093}, {2, 1123}, {2, 1151}, {2, 1153}, {2, 1193},
{2, 1223}, {2, 1231}, {2, 1283}, {2, 1301}, {2, 1303}, {2, 1319}, {2, 1361}, {2, 1439}, {2, 1447},
{2, 1453}, {2, 1471}, {2, 1481}, {2, 1523}, {2, 1531}, {2, 1543}, {2, 1549}, {2, 1579}, {2, 1597},
{2, 1621}, {2, 1657}, {2, 1801}, {2, 1831}, {2, 1867}, {2, 1871}, {2, 1907}, {2, 1993}, {2, 2027},
{2, 2053}, {2, 2083}, {2, 2111}, {2, 2131}, {2, 2137}, {2, 2141}, {2, 2143}, {2, 2203}, {2, 2213},
{2, 2293}, {2, 2333}, {2, 2339}, {2, 2371}, {2, 2447}, {2, 2531}, {2, 2549}, {2, 2551}, {2, 2557},
{2, 2591}, {2, 2633}, {2, 2659}, {2, 2677}, {2, 2713}, {2, 2719}, {2, 2753}, {2, 2777}, {2, 2819},
{2, 2843}, {2, 2851}, {2, 2999}, {2, 3019}, {2, 3037}, {2, 3049}, {2, 3067}, {2, 3119}, {2, 3137},
{2, 3167}, {2, 3187}, {2, 3217}, {2, 3229}, {2, 3271}, {2, 3319}, {2, 3391}, {2, 3407}, {2, 5, 11},
{2, 5, 23}, {2, 5, 59}, {2, 5, 61}, {2, 5, 71}, {2, 5, 73}, {2, 5, 79}, {2, 5, 101}, {2, 5, 103}, {2, 5, 251},
{2, 5, 257}, {2, 5, 263}, {2, 5, 269}, {2, 5, 401}, {2, 5, 457}, {2, 5, 463}, {2, 5, 467}, {2, 5, 499},
{2, 5, 503}, {2, 5, 557}, {2, 5, 613}, {2, 5, 619}, {2, 5, 643}, {2, 5, 659}, {2, 11, 23}, {2, 11, 29},
{2, 11, 193}, {2, 11, 223}, {2, 11, 257}, {2, 11, 311}, {2, 23, 59}, {2, 23, 61}, {2, 23, 71}, {2, 23, 73},
{2, 23, 137}, {2, 29, 61}, {2, 31, 61}, {2, 31, 101}

SL₂(F₂₄):

{2647}, {2, 29}, {2, 41}, {2, 137}, {2, 173}, {2, 199}, {2, 223}, {2, 251}, {2, 311}, {2, 349}, {2, 419},
{2, 431}, {2, 523}, {2, 619}, {2, 673}, {2, 739}, {2, 839}, {2, 853}, {2, 863}, {2, 911}, {2, 929},
{2, 967}, {2, 977}, {2, 997}, {2, 1097}, {2, 1103}, {2, 1187}, {2, 1201}, {2, 1237}, {2, 1289},
{2, 1291}, {2, 1423}, {2, 1531}, {2, 1601}, {2, 1663}, {2, 1697}, {2, 1741}, {2, 1787}, {2, 1867},
{2, 1933}, {2, 1997}, {2, 2011}, {2, 2029}, {2, 2083}, {2, 2087}, {2, 2129}, {2, 2141}, {2, 2143},
{2, 2179}, {2, 2203}, {2, 2239}, {2, 2243}, {2, 2269}, {2, 2333}, {2, 2347}, {2, 2357}, {2, 2377},
{2, 2381}, {2, 2393}, {2, 2399}, {2, 2473}, {2, 2543}, {2, 2593}, {2, 2657}, {2, 2671}, {2, 2753},
{2, 2791}, {2, 2879}, {2, 3011}, {2, 3023}, {2, 3061}, {2, 3109}, {2, 3191}, {2, 3251}, {2, 3323},
{2, 3389}, {2, 3413}, {2, 3, 5}, {2, 3, 11}, {2, 3, 17}, {2, 3, 31}, {2, 3, 53}, {2, 3, 61}, {2, 3, 79},
{2, 3, 101}, {2, 3, 127}, {2, 3, 131}, {2, 3, 163}, {2, 3, 211}, {2, 3, 239}, {2, 3, 271}, {2, 3, 401},
{2, 3, 461}, {2, 3, 499}, {2, 3, 509}, {2, 3, 521}, {2, 3, 541}, {2, 3, 601}, {2, 3, 641}, {2, 3, 677},
{2, 3, 743}, {2, 3, 797}, {2, 3, 809}, {2, 3, 859}, {2, 3, 881}, {2, 3, 907}, {2, 3, 991}, {2, 3, 1033},
{2, 3, 1039}, {2, 3, 1129}, {2, 5, 11}, {2, 5, 13}, {2, 5, 23}, {2, 5, 71}, {2, 5, 89}, {2, 5, 97}, {2, 5, 103},
{2, 5, 107}, {2, 5, 151}, {2, 5, 263}, {2, 5, 367}, {2, 5, 421}, {2, 5, 463}, {2, 5, 557}, {2, 5, 569},
{2, 5, 571}, {2, 5, 587}, {2, 5, 601}, {2, 5, 659}, {2, 7, 11}, {2, 7, 43}, {2, 7, 67}, {2, 7, 89}, {2, 7, 97},
{2, 7, 113}, {2, 7, 139}, {2, 7, 163}, {2, 7, 227}, {2, 7, 241}, {2, 7, 331}, {2, 7, 379}, {2, 7, 409},
{2, 7, 449}, {2, 7, 491}, {2, 11, 17}, {2, 11, 19}, {2, 11, 37}, {2, 11, 53}, {2, 11, 59}, {2, 11, 101},
{2, 11, 197}, {2, 11, 233}, {2, 11, 241}, {2, 11, 257}, {2, 13, 43}, {2, 13, 59}, {2, 13, 61}, {2, 13, 127},
{2, 13, 131}, {2, 13, 139}, {2, 13, 157}, {2, 13, 179}, {2, 13, 257}, {2, 17, 19}, {2, 17, 149}, {2, 19, 53},
{2, 19, 61}, {2, 19, 71}, {2, 19, 83}, {2, 19, 97}, {2, 19, 101}, {2, 19, 103}, {2, 19, 109}, {2, 19, 113},
{2, 23, 31}, {2, 23, 37}, {2, 23, 67}, {2, 23, 103}, {2, 23, 113}, {2, 23, 139}, {2, 31, 37}, {2, 31, 73},
{2, 37, 67}, {2, 37, 89}, {2, 43, 61}, {2, 43, 73}, {2, 47, 73}, {2, 53, 59}, {2, 53, 61}, {2, 3, 7, 19},

$\{2, 3, 7, 83\}, \{2, 3, 19, 47\}, \{2, 5, 7, 19\}, \{2, 5, 7, 73\}, \{2, 5, 19, 31\}$

$\underline{\text{SL}_2(\mathbb{F}_{2^5})}$:

$\{2633\}, \{2, 11\}, \{2, 23\}, \{2, 43\}, \{2, 53\}, \{2, 157\}, \{2, 163\}, \{2, 181\}, \{2, 193\}, \{2, 197\}, \{2, 229\},$
 $\{2, 257\}, \{2, 263\}, \{2, 269\}, \{2, 283\}, \{2, 347\}, \{2, 373\}, \{2, 419\}, \{2, 541\}, \{2, 569\}, \{2, 587\},$
 $\{2, 607\}, \{2, 613\}, \{2, 617\}, \{2, 661\}, \{2, 673\}, \{2, 683\}, \{2, 691\}, \{2, 719\}, \{2, 727\}, \{2, 811\},$
 $\{2, 877\}, \{2, 881\}, \{2, 997\}, \{2, 1009\}, \{2, 1103\}, \{2, 1117\}, \{2, 1201\}, \{2, 1217\}, \{2, 1231\}, \{2, 1237\},$
 $\{2, 1283\}, \{2, 1289\}, \{2, 1291\}, \{2, 1327\}, \{2, 1367\}, \{2, 1381\}, \{2, 1471\}, \{2, 1511\}, \{2, 1567\},$
 $\{2, 1579\}, \{2, 1597\}, \{2, 1619\}, \{2, 1663\}, \{2, 1667\}, \{2, 1669\}, \{2, 1753\}, \{2, 1889\}, \{2, 1931\},$
 $\{2, 1933\}, \{2, 2011\}, \{2, 2129\}, \{2, 2161\}, \{2, 2213\}, \{2, 2267\}, \{2, 2281\}, \{2, 2287\}, \{2, 2333\},$
 $\{2, 2357\}, \{2, 2389\}, \{2, 2393\}, \{2, 2423\}, \{2, 2467\}, \{2, 2549\}, \{2, 2551\}, \{2, 2617\}, \{2, 2647\},$
 $\{2, 2663\}, \{2, 2707\}, \{2, 2711\}, \{2, 2767\}, \{2, 2777\}, \{2, 2789\}, \{2, 2797\}, \{2, 2851\}, \{2, 3019\},$
 $\{2, 3061\}, \{2, 3109\}, \{2, 3187\}, \{2, 3391\}, \{2, 3433\}, \{2, 3, 13\}, \{2, 3, 29\}, \{2, 3, 37\}, \{2, 3, 47\},$
 $\{2, 3, 101\}, \{2, 3, 103\}, \{2, 3, 167\}, \{2, 3, 191\}, \{2, 3, 227\}, \{2, 3, 233\}, \{2, 3, 241\}, \{2, 3, 317\},$
 $\{2, 3, 431\}, \{2, 3, 433\}, \{2, 3, 443\}, \{2, 3, 449\}, \{2, 3, 521\}, \{2, 3, 577\}, \{2, 3, 631\}, \{2, 3, 643\},$
 $\{2, 3, 677\}, \{2, 3, 733\}, \{2, 3, 787\}, \{2, 3, 823\}, \{2, 3, 829\}, \{2, 3, 859\}, \{2, 3, 863\}, \{2, 3, 953\},$
 $\{2, 3, 1021\}, \{2, 3, 1091\}, \{2, 3, 1097\}, \{2, 3, 1109\}, \{2, 5, 29\}, \{2, 5, 31\}, \{2, 5, 37\}, \{2, 5, 41\},$
 $\{2, 5, 101\}, \{2, 5, 109\}, \{2, 5, 131\}, \{2, 5, 241\}, \{2, 5, 307\}, \{2, 5, 379\}, \{2, 5, 433\}, \{2, 5, 461\},$
 $\{2, 5, 463\}, \{2, 5, 467\}, \{2, 7, 41\}, \{2, 7, 59\}, \{2, 7, 107\}, \{2, 7, 241\}, \{2, 7, 271\}, \{2, 7, 313\}, \{2, 7, 353\},$
 $\{2, 7, 409\}, \{2, 7, 457\}, \{2, 7, 479\}, \{2, 13, 29\}, \{2, 13, 47\}, \{2, 13, 151\}, \{2, 13, 167\}, \{2, 13, 199\},$
 $\{2, 17, 29\}, \{2, 17, 31\}, \{2, 17, 37\}, \{2, 17, 41\}, \{2, 17, 67\}, \{2, 17, 71\}, \{2, 17, 73\}, \{2, 17, 127\},$
 $\{2, 19, 37\}, \{2, 19, 61\}, \{2, 29, 31\}, \{2, 29, 59\}, \{2, 29, 61\}, \{2, 29, 79\}, \{2, 31, 59\}, \{2, 31, 67\},$
 $\{2, 37, 41\}, \{2, 37, 89\}, \{2, 41, 47\}, \{2, 41, 71\}, \{2, 41, 79\}, \{2, 47, 67\}, \{2, 47, 71\}, \{2, 3, 5, 127\},$
 $\{2, 3, 5, 199\}, \{2, 3, 7, 17\}, \{2, 3, 7, 97\}, \{2, 3, 19, 31\}, \{2, 5, 13, 17\}, \{2, 5, 13, 19\}, \{2, 7, 13, 17\}$

$\underline{\text{SL}_2(\mathbb{F}_{2^6})}$:

$\{2767\}, \{2, 3\}, \{2, 7\}, \{2, 41\}, \{2, 43\}, \{2, 53\}, \{2, 271\}, \{2, 349\}, \{2, 383\}, \{2, 389\}, \{2, 401\},$
 $\{2, 457\}, \{2, 521\}, \{2, 571\}, \{2, 647\}, \{2, 653\}, \{2, 701\}, \{2, 809\}, \{2, 859\}, \{2, 911\}, \{2, 919\},$
 $\{2, 929\}, \{2, 991\}, \{2, 1051\}, \{2, 1097\}, \{2, 1151\}, \{2, 1237\}, \{2, 1367\}, \{2, 1427\}, \{2, 1487\},$
 $\{2, 1549\}, \{2, 1597\}, \{2, 1607\}, \{2, 1609\}, \{2, 1627\}, \{2, 1693\}, \{2, 1723\}, \{2, 1753\}, \{2, 1759\},$
 $\{2, 1823\}, \{2, 1979\}, \{2, 2011\}, \{2, 2027\}, \{2, 2089\}, \{2, 2293\}, \{2, 2333\}, \{2, 2383\}, \{2, 2551\},$
 $\{2, 2633\}, \{2, 3001\}, \{2, 3061\}, \{2, 3089\}, \{2, 3137\}, \{2, 3253\}, \{2, 3331\}, \{2, 5, 13\}, \{2, 5, 17\},$
 $\{2, 5, 23\}, \{2, 5, 71\}, \{2, 5, 113\}, \{2, 5, 131\}, \{2, 5, 139\}, \{2, 5, 157\}, \{2, 5, 167\}, \{2, 5, 307\},$
 $\{2, 5, 443\}, \{2, 5, 491\}, \{2, 5, 499\}, \{2, 5, 541\}, \{2, 5, 577\}, \{2, 5, 587\}, \{2, 5, 593\}, \{2, 5, 643\},$
 $\{2, 11, 17\}, \{2, 11, 23\}, \{2, 11, 71\}, \{2, 11, 107\}, \{2, 11, 167\}, \{2, 11, 223\}, \{2, 11, 233\}, \{2, 13, 17\},$
 $\{2, 13, 31\}, \{2, 13, 37\}, \{2, 13, 131\}, \{2, 13, 137\}, \{2, 13, 233\}, \{2, 17, 79\}, \{2, 17, 179\}, \{2, 17, 181\},$
 $\{2, 17, 193\}, \{2, 19, 67\}, \{2, 19, 131\}, \{2, 19, 163\}, \{2, 23, 131\}, \{2, 23, 139\}, \{2, 29, 79\}, \{2, 29, 89\},$
 $\{2, 29, 103\}, \{2, 31, 83\}, \{2, 31, 89\}, \{2, 37, 47\}, \{2, 37, 73\}, \{2, 47, 59\}$

$\underline{\text{SL}_2(\mathbb{F}_{2^7})}$:

$\{2, 233\}, \{2, 241\}, \{2, 281\}, \{2, 331\}, \{2, 373\}, \{2, 397\}, \{2, 421\}, \{2, 443\}, \{2, 461\}, \{2, 547\},$
 $\{2, 571\}, \{2, 607\}, \{2, 617\}, \{2, 619\}, \{2, 653\}, \{2, 677\}, \{2, 709\}, \{2, 761\}, \{2, 823\}, \{2, 863\},$
 $\{2, 911\}, \{2, 941\}, \{2, 1031\}, \{2, 1051\}, \{2, 1171\}, \{2, 1187\}, \{2, 1193\}, \{2, 1217\}, \{2, 1249\},$
 $\{2, 1283\}, \{2, 1399\}, \{2, 1433\}, \{2, 1459\}, \{2, 1609\}, \{2, 1699\}, \{2, 1709\}, \{2, 1723\}, \{2, 1823\},$
 $\{2, 2087\}, \{2, 2129\}, \{2, 2269\}, \{2, 2437\}, \{2, 2663\}, \{2, 2683\}, \{2, 2741\}, \{2, 2753\}, \{2, 2897\},$

$\{2, 2903\}, \{2, 2953\}, \{2, 3041\}, \{2, 3109\}, \{2, 3169\}, \{2, 3373\}, \{2, 3, 19\}, \{2, 3, 37\}, \{2, 3, 103\},$
 $\{2, 3, 263\}, \{2, 3, 293\}, \{2, 3, 337\}, \{2, 3, 431\}, \{2, 3, 467\}, \{2, 3, 499\}, \{2, 3, 541\}, \{2, 3, 569\},$
 $\{2, 3, 631\}, \{2, 3, 773\}, \{2, 3, 977\}, \{2, 3, 1019\}, \{2, 3, 1063\}, \{2, 3, 1069\}, \{2, 3, 1091\}, \{2, 3, 1123\},$
 $\{2, 5, 59\}, \{2, 5, 61\}, \{2, 5, 73\}, \{2, 5, 79\}, \{2, 5, 103\}, \{2, 5, 107\}, \{2, 5, 137\}, \{2, 5, 223\}, \{2, 5, 389\},$
 $\{2, 5, 463\}, \{2, 5, 499\}, \{2, 5, 509\}, \{2, 5, 557\}, \{2, 5, 613\}, \{2, 5, 659\}, \{2, 5, 661\}, \{2, 7, 23\},$
 $\{2, 7, 31\}, \{2, 7, 79\}, \{2, 7, 83\}, \{2, 7, 101\}, \{2, 7, 103\}, \{2, 7, 137\}, \{2, 7, 163\}, \{2, 7, 167\}, \{2, 7, 227\},$
 $\{2, 7, 239\}, \{2, 7, 277\}, \{2, 7, 283\}, \{2, 7, 383\}, \{2, 7, 409\}, \{2, 7, 463\}, \{2, 7, 479\}, \{2, 7, 487\},$
 $\{2, 11, 19\}, \{2, 11, 103\}, \{2, 11, 151\}, \{2, 11, 197\}, \{2, 11, 211\}, \{2, 11, 277\}, \{2, 11, 283\}, \{2, 11, 313\},$
 $\{2, 13, 41\}, \{2, 13, 71\}, \{2, 13, 101\}, \{2, 13, 113\}, \{2, 13, 137\}, \{2, 13, 227\}, \{2, 17, 83\}, \{2, 17, 131\},$
 $\{2, 17, 173\}, \{2, 19, 31\}, \{2, 19, 41\}, \{2, 19, 83\}, \{2, 19, 97\}, \{2, 23, 79\}, \{2, 23, 89\}, \{2, 29, 59\},$
 $\{2, 29, 67\}, \{2, 29, 89\}, \{2, 29, 101\}, \{2, 31, 53\}, \{2, 31, 89\}, \{2, 41, 71\}, \{2, 41, 83\}, \{2, 47, 59\},$
 $\{2, 47, 67\}, \{2, 3, 5, 139\}, \{2, 3, 5, 163\}, \{2, 3, 5, 193\}, \{2, 3, 5, 197\}, \{2, 3, 7, 131\}, \{2, 3, 7, 149\},$
 $\{2, 3, 7, 151\}, \{2, 3, 11, 59\}, \{2, 3, 11, 73\}, \{2, 3, 17, 61\}, \{2, 3, 23, 47\}, \{2, 5, 7, 17\}, \{2, 5, 7, 43\},$
 $\{2, 5, 11, 29\}, \{2, 5, 11, 31\}, \{2, 5, 11, 37\}, \{2, 5, 11, 53\}, \{2, 5, 13, 53\}, \{2, 7, 13, 37\}$

$\underline{\text{SL}_2(\mathbb{F}_{28})}$:

$\{2, 5\}, \{2, 29\}, \{2, 31\}, \{2, 293\}, \{2, 307\}, \{2, 421\}, \{2, 479\}, \{2, 491\}, \{2, 521\}, \{2, 557\}, \{2, 601\},$
 $\{2, 619\}, \{2, 647\}, \{2, 677\}, \{2, 701\}, \{2, 757\}, \{2, 787\}, \{2, 919\}, \{2, 1033\}, \{2, 1051\}, \{2, 1091\},$
 $\{2, 1163\}, \{2, 1171\}, \{2, 1181\}, \{2, 1187\}, \{2, 1279\}, \{2, 1447\}, \{2, 1567\}, \{2, 1607\}, \{2, 1609\},$
 $\{2, 1667\}, \{2, 1693\}, \{2, 1741\}, \{2, 1933\}, \{2, 2017\}, \{2, 2203\}, \{2, 2293\}, \{2, 2411\}, \{2, 2423\},$
 $\{2, 2441\}, \{2, 2473\}, \{2, 2579\}, \{2, 2609\}, \{2, 2731\}, \{2, 2753\}, \{2, 2791\}, \{2, 2801\}, \{2, 2927\},$
 $\{2, 2963\}, \{2, 2971\}, \{2, 3001\}, \{2, 3037\}, \{2, 3089\}, \{2, 3163\}, \{2, 3169\}, \{2, 3187\}, \{2, 3299\},$
 $\{2, 3301\}, \{2, 3373\}, \{2, 3, 37\}, \{2, 3, 83\}, \{2, 3, 89\}, \{2, 3, 331\}, \{2, 3, 349\}, \{2, 3, 397\}, \{2, 3, 457\},$
 $\{2, 3, 487\}, \{2, 3, 719\}, \{2, 3, 773\}, \{2, 3, 829\}, \{2, 3, 937\}, \{2, 3, 977\}, \{2, 3, 1063\}, \{2, 3, 1129\},$
 $\{2, 7, 43\}, \{2, 7, 47\}, \{2, 7, 59\}, \{2, 7, 131\}, \{2, 7, 139\}, \{2, 7, 167\}, \{2, 7, 239\}, \{2, 7, 269\}, \{2, 7, 359\},$
 $\{2, 7, 373\}, \{2, 7, 379\}, \{2, 11, 13\}, \{2, 11, 67\}, \{2, 11, 73\}, \{2, 11, 131\}, \{2, 11, 167\}, \{2, 11, 197\},$
 $\{2, 13, 61\}, \{2, 13, 67\}, \{2, 13, 137\}, \{2, 13, 149\}, \{2, 13, 151\}, \{2, 13, 157\}, \{2, 13, 197\}, \{2, 17, 47\},$
 $\{2, 17, 61\}, \{2, 17, 71\}, \{2, 17, 73\}, \{2, 17, 83\}, \{2, 17, 101\}, \{2, 17, 109\}, \{2, 17, 139\}, \{2, 17, 163\},$
 $\{2, 17, 173\}, \{2, 19, 53\}, \{2, 19, 97\}, \{2, 23, 89\}, \{2, 23, 109\}, \{2, 37, 59\}, \{2, 37, 67\}, \{2, 41, 43\},$
 $\{2, 41, 79\}, \{2, 3, 17, 41\}, \{2, 3, 19, 41\}, \{2, 7, 17, 23\}$

$\underline{\text{SL}_2(\mathbb{F}_{29})}$:

$\{3271\}, \{2, 3\}, \{2, 7\}, \{2, 53\}, \{2, 277\}, \{2, 313\}, \{2, 317\}, \{2, 353\}, \{2, 439\}, \{2, 457\}, \{2, 547\},$
 $\{2, 557\}, \{2, 563\}, \{2, 761\}, \{2, 811\}, \{2, 947\}, \{2, 1181\}, \{2, 1193\}, \{2, 1213\}, \{2, 1249\}, \{2, 1319\},$
 $\{2, 1409\}, \{2, 1601\}, \{2, 1657\}, \{2, 1787\}, \{2, 1907\}, \{2, 1979\}, \{2, 2053\}, \{2, 2131\}, \{2, 2207\},$
 $\{2, 2383\}, \{2, 2441\}, \{2, 2459\}, \{2, 2621\}, \{2, 2663\}, \{2, 2803\}, \{2, 2861\}, \{2, 2963\}, \{2, 3037\},$
 $\{2, 3209\}, \{2, 3319\}, \{2, 3433\}, \{2, 5, 19\}, \{2, 5, 137\}, \{2, 5, 173\}, \{2, 5, 199\}, \{2, 5, 337\}, \{2, 5, 503\},$
 $\{2, 5, 677\}, \{2, 11, 13\}, \{2, 11, 157\}, \{2, 11, 163\}, \{2, 11, 179\}, \{2, 11, 181\}, \{2, 11, 191\}, \{2, 11, 239\},$
 $\{2, 11, 271\}, \{2, 13, 109\}, \{2, 13, 191\}, \{2, 13, 251\}, \{2, 17, 79\}, \{2, 17, 83\}, \{2, 17, 107\}, \{2, 17, 127\},$
 $\{2, 17, 149\}, \{2, 17, 191\}, \{2, 19, 43\}, \{2, 19, 67\}, \{2, 19, 79\}, \{2, 19, 83\}, \{2, 19, 113\}, \{2, 19, 127\},$
 $\{2, 19, 139\}, \{2, 23, 41\}, \{2, 29, 37\}, \{2, 29, 73\}, \{2, 31, 59\}, \{2, 5, 13, 41\}$

$\underline{\text{SL}_2(\mathbb{F}_{210})}$:

$\{2, 5\}, \{2, 503\}, \{2, 509\}, \{2, 523\}, \{2, 587\}, \{2, 719\}, \{2, 769\}, \{2, 811\}, \{2, 1063\}, \{2, 1117\},$
 $\{2, 1193\}, \{2, 1213\}, \{2, 1217\}, \{2, 1291\}, \{2, 1459\}, \{2, 1499\}, \{2, 1657\}, \{2, 1693\}, \{2, 1699\},$

$\{2, 1741\}, \{2, 1759\}, \{2, 1789\}, \{2, 1831\}, \{2, 2089\}, \{2, 2113\}, \{2, 2129\}, \{2, 2137\}, \{2, 2347\},$
 $\{2, 2351\}, \{2, 2647\}, \{2, 2671\}, \{2, 2711\}, \{2, 2713\}, \{2, 2777\}, \{2, 2797\}, \{2, 2803\}, \{2, 2861\},$
 $\{2, 3209\}, \{2, 3271\}, \{2, 3391\}, \{2, 3, 311\}, \{2, 3, 379\}, \{2, 3, 389\}, \{2, 3, 419\}, \{2, 3, 479\},$
 $\{2, 3, 521\}, \{2, 3, 557\}, \{2, 3, 601\}, \{2, 3, 607\}, \{2, 3, 653\}, \{2, 3, 659\}, \{2, 3, 709\}, \{2, 3, 1031\},$
 $\{2, 3, 1033\}, \{2, 3, 1039\}, \{2, 7, 109\}, \{2, 7, 149\}, \{2, 7, 241\}, \{2, 7, 331\}, \{2, 7, 449\}, \{2, 7, 457\},$
 $\{2, 7, 463\}, \{2, 11, 19\}, \{2, 11, 83\}, \{2, 11, 127\}, \{2, 11, 179\}, \{2, 13, 19\}, \{2, 13, 73\}, \{2, 13, 83\},$
 $\{2, 13, 101\}, \{2, 13, 107\}, \{2, 13, 131\}, \{2, 13, 179\}, \{2, 13, 181\}, \{2, 13, 193\}, \{2, 13, 257\}, \{2, 17, 59\},$
 $\{2, 17, 173\}, \{2, 17, 199\}, \{2, 19, 73\}, \{2, 19, 127\}, \{2, 19, 149\}, \{2, 19, 157\}, \{2, 23, 29\}, \{2, 23, 83\},$
 $\{2, 31, 59\}, \{2, 41, 61\}, \{2, 41, 67\}, \{2, 47, 67\}, \{2, 3, 11, 79\}, \{2, 3, 11, 89\}, \{2, 3, 17, 43\}, \{2, 3, 23, 43\},$
 $\{2, 3, 23, 47\}, \{2, 7, 13, 29\}, \{2, 7, 17, 23\}$

$\underline{\text{SL}_2(\mathbb{F}_{2^{11}})}$:

$\{2, 47\}, \{2, 367\}, \{2, 409\}, \{2, 433\}, \{2, 449\}, \{2, 569\}, \{2, 599\}, \{2, 617\}, \{2, 641\}, \{2, 877\},$
 $\{2, 1049\}, \{2, 1123\}, \{2, 1129\}, \{2, 1201\}, \{2, 1229\}, \{2, 1277\}, \{2, 1291\}, \{2, 1381\}, \{2, 1543\},$
 $\{2, 1571\}, \{2, 1607\}, \{2, 1747\}, \{2, 1877\}, \{2, 1979\}, \{2, 1987\}, \{2, 1997\}, \{2, 2053\}, \{2, 2087\},$
 $\{2, 2221\}, \{2, 2297\}, \{2, 2477\}, \{2, 2503\}, \{2, 2693\}, \{2, 2741\}, \{2, 2861\}, \{2, 3331\}, \{2, 3433\},$
 $\{2, 3, 29\}, \{2, 3, 97\}, \{2, 3, 383\}, \{2, 3, 463\}, \{2, 3, 613\}, \{2, 3, 643\}, \{2, 3, 673\}, \{2, 3, 683\},$
 $\{2, 3, 709\}, \{2, 3, 727\}, \{2, 3, 911\}, \{2, 3, 991\}, \{2, 3, 997\}, \{2, 3, 1069\}, \{2, 3, 1103\}, \{2, 5, 89\},$
 $\{2, 5, 97\}, \{2, 5, 251\}, \{2, 5, 257\}, \{2, 5, 337\}, \{2, 5, 457\}, \{2, 5, 503\}, \{2, 5, 547\}, \{2, 5, 677\},$
 $\{2, 7, 61\}, \{2, 7, 173\}, \{2, 7, 227\}, \{2, 7, 257\}, \{2, 7, 277\}, \{2, 7, 397\}, \{2, 11, 79\}, \{2, 11, 89\},$
 $\{2, 11, 127\}, \{2, 11, 157\}, \{2, 13, 109\}, \{2, 13, 113\}, \{2, 13, 173\}, \{2, 13, 211\}, \{2, 13, 227\}, \{2, 19, 97\},$
 $\{2, 19, 103\}, \{2, 23, 73\}, \{2, 23, 101\}, \{2, 31, 73\}, \{2, 41, 53\}, \{2, 43, 61\}, \{2, 3, 5, 211\}, \{2, 3, 5, 229\},$
 $\{2, 3, 7, 157\}, \{2, 3, 11, 61\}, \{2, 3, 13, 71\}, \{2, 5, 13, 37\}, \{2, 5, 17, 23\}, \{2, 5, 17, 31\}, \{2, 5, 19, 29\},$
 $\{2, 5, 19, 31\}, \{2, 7, 13, 19\}$

$\underline{\text{SL}_2(\mathbb{F}_{2^{12}})}$:

$\{2, 7\}, \{2, 41\}, \{2, 43\}, \{2, 337\}, \{2, 379\}, \{2, 467\}, \{2, 577\}, \{2, 601\}, \{2, 787\}, \{2, 929\}, \{2, 1061\},$
 $\{2, 1069\}, \{2, 1193\}, \{2, 1201\}, \{2, 1399\}, \{2, 1693\}, \{2, 1753\}, \{2, 1949\}, \{2, 2053\}, \{2, 2381\},$
 $\{2, 2389\}, \{2, 2393\}, \{2, 2423\}, \{2, 2621\}, \{2, 2671\}, \{2, 2677\}, \{2, 2719\}, \{2, 2749\}, \{2, 2909\},$
 $\{2, 3163\}, \{2, 3187\}, \{2, 3347\}, \{2, 3361\}, \{2, 3413\}, \{2, 3, 73\}, \{2, 3, 89\}, \{2, 3, 113\}, \{2, 3, 353\},$
 $\{2, 3, 503\}, \{2, 3, 569\}, \{2, 3, 733\}, \{2, 3, 883\}, \{2, 3, 1031\}, \{2, 5, 19\}, \{2, 5, 101\}, \{2, 5, 127\},$
 $\{2, 5, 191\}, \{2, 5, 233\}, \{2, 5, 313\}, \{2, 5, 317\}, \{2, 5, 347\}, \{2, 5, 409\}, \{2, 5, 571\}, \{2, 11, 109\},$
 $\{2, 11, 173\}, \{2, 11, 257\}, \{2, 17, 173\}, \{2, 19, 47\}, \{2, 19, 71\}, \{2, 23, 59\}, \{2, 29, 71\}, \{2, 3, 17, 59\},$
 $\{2, 3, 19, 53\}$

$\underline{\text{SL}_2(\mathbb{F}_{2^{13}})}$:

$\{2, 487\}, \{2, 809\}, \{2, 877\}, \{2, 919\}, \{2, 991\}, \{2, 1187\}, \{2, 1367\}, \{2, 1429\}, \{2, 1511\}, \{2, 1553\},$
 $\{2, 1621\}, \{2, 1657\}, \{2, 1667\}, \{2, 1913\}, \{2, 1993\}, \{2, 1997\}, \{2, 2053\}, \{2, 2069\}, \{2, 2273\},$
 $\{2, 2467\}, \{2, 2591\}, \{2, 2851\}, \{2, 3049\}, \{2, 3253\}, \{2, 3301\}, \{2, 3, 31\}, \{2, 3, 41\}, \{2, 3, 107\},$
 $\{2, 3, 113\}, \{2, 3, 661\}, \{2, 3, 757\}, \{2, 3, 839\}, \{2, 5, 109\}, \{2, 5, 271\}, \{2, 5, 283\}, \{2, 5, 571\},$
 $\{2, 5, 641\}, \{2, 5, 683\}, \{2, 7, 191\}, \{2, 7, 197\}, \{2, 7, 199\}, \{2, 7, 269\}, \{2, 11, 131\}, \{2, 11, 181\},$
 $\{2, 11, 197\}, \{2, 13, 89\}, \{2, 13, 223\}, \{2, 13, 227\}, \{2, 13, 229\}, \{2, 17, 113\}, \{2, 17, 127\}, \{2, 19, 103\},$
 $\{2, 19, 139\}, \{2, 19, 151\}, \{2, 23, 61\}, \{2, 29, 67\}, \{2, 31, 41\}, \{2, 37, 41\}, \{2, 3, 17, 67\}, \{2, 3, 19, 59\},$
 $\{2, 3, 29, 37\}, \{2, 5, 7, 89\}, \{2, 5, 13, 47\}, \{2, 5, 17, 29\}, \{2, 7, 11, 31\}, \{2, 7, 11, 37\}$

$SL_2(\mathbb{F}_{2^{14}})$:

{2, 499}, {2, 839}, {2, 991}, {2, 1051}, {2, 1201}, {2, 1277}, {2, 1327}, {2, 1381}, {2, 1439},
{2, 1447}, {2, 1483}, {2, 1601}, {2, 1699}, {2, 1733}, {2, 2011}, {2, 2027}, {2, 2053}, {2, 2143},
{2, 2297}, {2, 2393}, {2, 2819}, {2, 3119}, {2, 3413}, {2, 3, 769}, {2, 3, 821}, {2, 3, 883}, {2, 3, 1009},
{2, 3, 1013}, {2, 3, 1039}, {2, 3, 1063}, {2, 3, 1097}, {2, 5, 17}, {2, 5, 23}, {2, 5, 359}, {2, 5, 401},
{2, 5, 431}, {2, 5, 461}, {2, 5, 491}, {2, 5, 643}, {2, 5, 653}, {2, 7, 67}, {2, 7, 307}, {2, 11, 23},
{2, 11, 97}, {2, 11, 107}, {2, 11, 263}, {2, 13, 157}, {2, 13, 181}, {2, 17, 151}, {2, 17, 193}, {2, 19, 73},
{2, 19, 79}, {2, 19, 139}, {2, 29, 43}, {2, 29, 59}, {2, 29, 97}, {2, 37, 43}, {2, 37, 47}, {2, 37, 59},
{2, 41, 47}, {2, 3, 13, 83}, {2, 7, 13, 31}

$SL_2(\mathbb{F}_{2^{15}})$:

{2, 11}, {2, 541}, {2, 709}, {2, 727}, {2, 769}, {2, 863}, {2, 977}, {2, 1021}, {2, 1039}, {2, 1279},
{2, 1291}, {2, 1429}, {2, 1453}, {2, 1657}, {2, 1697}, {2, 2017}, {2, 2053}, {2, 2083}, {2, 2287},
{2, 2297}, {2, 2357}, {2, 2609}, {2, 2621}, {2, 2837}, {2, 2887}, {2, 3001}, {2, 3019}, {2, 3299},
{2, 3, 13}, {2, 3, 491}, {2, 3, 563}, {2, 3, 641}, {2, 3, 811}, {2, 3, 941}, {2, 3, 983}, {2, 3, 1013},
{2, 5, 229}, {2, 5, 239}, {2, 5, 349}, {2, 5, 379}, {2, 5, 509}, {2, 7, 19}, {2, 7, 53}, {2, 7, 229}, {2, 7, 389},
{2, 7, 467}, {2, 13, 151}, {2, 19, 151}, {2, 23, 101}, {2, 29, 73}, {2, 29, 101}, {2, 31, 73}, {2, 3, 31, 37},
{2, 5, 7, 83}

$SL_2(\mathbb{F}_{2^{16}})$:

{2, 463}, {2, 593}, {2, 659}, {2, 673}, {2, 1367}, {2, 1409}, {2, 1429}, {2, 1559}, {2, 1571}, {2, 1613},
{2, 1847}, {2, 2729}, {2, 2749}, {2, 3019}, {2, 3181}, {2, 3229}, {2, 3259}, {2, 3323}, {2, 3343},
{2, 3407}, {2, 3, 109}, {2, 3, 751}, {2, 3, 761}, {2, 3, 877}, {2, 3, 907}, {2, 3, 1009}, {2, 3, 1051},
{2, 5, 277}, {2, 5, 281}, {2, 5, 353}, {2, 5, 389}, {2, 5, 431}, {2, 5, 547}, {2, 7, 233}, {2, 7, 307},
{2, 7, 379}, {2, 11, 223}, {2, 11, 313}, {2, 13, 79}, {2, 13, 103}, {2, 17, 113}, {2, 17, 139}, {2, 19, 59},
{2, 19, 167}, {2, 19, 173}, {2, 23, 107}, {2, 29, 47}, {2, 29, 61}, {2, 31, 89}, {2, 43, 79}, {2, 5, 11, 59},
{2, 5, 23, 29}

$SL_2(\mathbb{F}_{2^{17}})$:

{2, 887}, {2, 977}, {2, 1013}, {2, 1039}, {2, 1297}, {2, 1381}, {2, 1663}, {2, 1973}, {2, 1999},
{2, 2111}, {2, 2143}, {2, 2539}, {2, 2633}, {2, 2971}, {2, 3, 619}, {2, 3, 743}, {2, 3, 971}, {2, 3, 1033},
{2, 5, 131}, {2, 5, 293}, {2, 5, 331}, {2, 5, 397}, {2, 5, 613}, {2, 7, 181}, {2, 11, 137}, {2, 11, 139},
{2, 13, 149}, {2, 13, 179}, {2, 13, 223}, {2, 17, 151}, {2, 19, 167}, {2, 23, 67}, {2, 31, 47}, {2, 37, 73},
{2, 37, 89}, {2, 41, 59}, {2, 7, 13, 37}

$SL_2(\mathbb{F}_{2^{18}})$:

{2, 3}, {2, 13}, {2, 53}, {2, 613}, {2, 661}, {2, 691}, {2, 751}, {2, 757}, {2, 1307}, {2, 1409}, {2, 1447},
{2, 1667}, {2, 1693}, {2, 1699}, {2, 1951}, {2, 2143}, {2, 2309}, {2, 2347}, {2, 2371}, {2, 2741},
{2, 2903}, {2, 2909}, {2, 3137}, {2, 3163}, {2, 3169}, {2, 5, 367}, {2, 7, 359}, {2, 11, 151}, {2, 11, 199},
{2, 19, 101}, {2, 23, 71}, {2, 37, 73}

$SL_2(\mathbb{F}_{2^{19}})$:

{2, 643}, {2, 683}, {2, 739}, {2, 997}, {2, 1013}, {2, 1031}, {2, 1069}, {2, 1151}, {2, 1181}, {2, 1217},
{2, 1279}, {2, 1319}, {2, 1453}, {2, 1801}, {2, 2083}, {2, 2099}, {2, 2399}, {2, 2473}, {2, 2503},
{2, 2677}, {2, 2909}, {2, 2999}, {2, 3079}, {2, 3, 599}, {2, 3, 787}, {2, 3, 919}, {2, 3, 1051}, {2, 5, 383},

{2, 5, 467}, {2, 5, 487}, {2, 5, 587}, {2, 11, 149}, {2, 11, 283}, {2, 13, 181}, {2, 13, 229}, {2, 17, 101},
{2, 17, 103}, {2, 17, 107}, {2, 19, 149}, {2, 19, 163}, {2, 31, 107}, {2, 41, 43}, {2, 41, 61}, {2, 47, 53},
{2, 5, 17, 37}

$SL_2(\mathbb{F}_{220})$:

{2, 631}, {2, 1061}, {2, 1091}, {2, 1277}, {2, 1453}, {2, 1601}, {2, 1811}, {2, 1877}, {2, 2339},
{2, 2417}, {2, 2593}, {2, 2677}, {2, 2753}, {2, 2833}, {2, 3023}, {2, 3119}, {2, 3121}, {2, 3, 593},
{2, 3, 701}, {2, 3, 809}, {2, 3, 911}, {2, 3, 953}, {2, 3, 983}, {2, 3, 1109}, {2, 7, 283}, {2, 7, 317},
{2, 7, 331}, {2, 7, 449}, {2, 11, 113}, {2, 17, 109}, {2, 17, 197}, {2, 19, 113}, {2, 19, 127}, {2, 23, 89},
{2, 29, 71}, {2, 43, 61}

$SL_2(\mathbb{F}_{221})$:

{2, 743}, {2, 941}, {2, 1063}, {2, 1229}, {2, 1511}, {2, 1621}, {2, 1979}, {2, 2441}, {2, 2713},
{2, 2741}, {2, 2753}, {2, 2917}, {2, 2939}, {2, 3, 127}, {2, 3, 797}, {2, 3, 1061}, {2, 5, 541}, {2, 5, 677},
{2, 7, 211}, {2, 7, 223}, {2, 7, 293}, {2, 7, 311}, {2, 7, 373}, {2, 11, 257}, {2, 11, 283}, {2, 13, 97},
{2, 17, 97}, {2, 19, 89}, {2, 19, 151}, {2, 23, 97}, {2, 37, 89}, {2, 41, 59}, {2, 43, 47}, {2, 53, 59}

$SL_2(\mathbb{F}_{222})$:

{2, 47}, {2, 859}, {2, 881}, {2, 1021}, {2, 1049}, {2, 1103}, {2, 1171}, {2, 1423}, {2, 1571}, {2, 1621},
{2, 1987}, {2, 2083}, {2, 2269}, {2, 2273}, {2, 2281}, {2, 2659}, {2, 3343}, {2, 3, 691}, {2, 3, 863},
{2, 5, 311}, {2, 5, 373}, {2, 5, 647}, {2, 7, 263}, {2, 7, 281}, {2, 7, 397}, {2, 7, 439}, {2, 7, 467},
{2, 13, 167}, {2, 13, 197}, {2, 23, 79}, {2, 23, 109}, {2, 29, 109}

$SL_2(\mathbb{F}_{223})$:

{2, 733}, {2, 821}, {2, 823}, {2, 1117}, {2, 1439}, {2, 1559}, {2, 1889}, {2, 2689}, {2, 2719},
{2, 2731}, {2, 2861}, {2, 2969}, {2, 3067}, {2, 3121}, {2, 3167}, {2, 3299}, {2, 3319}, {2, 3331},
{2, 3, 827}, {2, 7, 271}, {2, 7, 313}, {2, 7, 349}, {2, 7, 389}, {2, 7, 439}, {2, 11, 193}, {2, 11, 211},
{2, 13, 127}, {2, 19, 163}, {2, 29, 79}, {2, 29, 89}, {2, 29, 101}, {2, 31, 43}, {2, 31, 67}, {2, 31, 109},
{2, 37, 79}, {2, 43, 71}, {2, 47, 71}, {2, 53, 61}

$SL_2(\mathbb{F}_{224})$:

{2, 13}, {2, 773}, {2, 797}, {2, 827}, {2, 1129}, {2, 1283}, {2, 1297}, {2, 1399}, {2, 1747}, {2, 1783},
{2, 2069}, {2, 2203}, {2, 2381}, {2, 2389}, {2, 2593}, {2, 2689}, {2, 3217}, {2, 3229}, {2, 3299},
{2, 3329}, {2, 3, 647}, {2, 3, 853}, {2, 11, 233}, {2, 17, 193}, {2, 19, 109}, {2, 19, 179}, {2, 37, 79}

$SL_2(\mathbb{F}_{225})$:

{2, 971}, {2, 1123}, {2, 1307}, {2, 1327}, {2, 1669}, {2, 1721}, {2, 1997}, {2, 2143}, {2, 2287},
{2, 3019}, {2, 3253}, {2, 3, 1021}, {2, 3, 1103}, {2, 5, 419}, {2, 5, 421}, {2, 5, 439}, {2, 5, 683},
{2, 7, 347}, {2, 11, 277}, {2, 17, 89}, {2, 29, 109}, {2, 31, 61}, {2, 37, 67}, {2, 43, 53}, {2, 53, 61}

$SL_2(\mathbb{F}_{226})$:

{2, 947}, {2, 1009}, {2, 1097}, {2, 1223}, {2, 1607}, {2, 2081}, {2, 2207}, {2, 2459}, {2, 2617},
{2, 2621}, {2, 2689}, {2, 2693}, {2, 2729}, {2, 3079}, {2, 3257}, {2, 3, 857}, {2, 3, 887}, {2, 3, 1019},
{2, 3, 1117}, {2, 5, 523}, {2, 7, 409}, {2, 7, 457}, {2, 31, 97}, {2, 43, 71}

$\text{SL}_2(\mathbb{F}_{227})$:

{2, 37}, {2, 53}, {2, 853}, {2, 967}, {2, 1019}, {2, 1231}, {2, 1423}, {2, 1823}, {2, 1993}, {2, 2027},
{2, 2477}, {2, 2521}, {2, 2693}, {2, 2797}, {2, 3343}, {2, 3359}, {2, 3413}, {2, 3, 1087}, {2, 3, 1091},
{2, 5, 521}, {2, 5, 607}, {2, 5, 619}, {2, 5, 659}, {2, 7, 251}, {2, 23, 107}, {2, 23, 113}, {2, 31, 71},
{2, 31, 103}, {2, 47, 71}

$\text{SL}_2(\mathbb{F}_{228})$:

{2, 829}, {2, 857}, {2, 983}, {2, 1163}, {2, 1213}, {2, 1249}, {2, 1567}, {2, 1889}, {2, 2063}, {2, 2153},
{2, 2411}, {2, 2423}, {2, 2447}, {2, 2749}, {2, 2837}, {2, 2857}, {2, 2927}, {2, 2963}, {2, 3167},
{2, 3361}, {2, 3373}, {2, 3, 947}, {2, 5, 577}, {2, 5, 653}, {2, 13, 139}, {2, 13, 191}, {2, 17, 157},
{2, 29, 53}, {2, 37, 61}, {2, 41, 71}, {2, 47, 59}

$\text{SL}_2(\mathbb{F}_{229})$:

{2, 1811}, {2, 2251}, {2, 2503}, {2, 2797}, {2, 2857}, {2, 2903}, {2, 3413}, {2, 3, 967}, {2, 5, 661},
{2, 7, 383}, {2, 11, 241}, {2, 11, 251}, {2, 11, 311}, {2, 17, 131}, {2, 19, 131}, {2, 23, 103}, {2, 29, 97},
{2, 31, 97}, {2, 47, 67}

$\text{SL}_2(\mathbb{F}_{230})$:

{2, 5}, {2, 1459}, {2, 1613}, {2, 1993}, {2, 2063}, {2, 2179}, {2, 2293}, {2, 2383}, {2, 2999}, {2, 3299},
{2, 3389}, {2, 7, 431}, {2, 11, 229}, {2, 11, 313}, {2, 17, 149}, {2, 17, 163}, {2, 19, 157}, {2, 41, 79},
{2, 53, 59}

$\text{SL}_2(\mathbb{F}_{231})$:

{2, 1663}, {2, 2207}, {2, 2549}, {2, 2621}, {2, 2713}, {2, 2969}, {2, 3221}, {2, 3343}, {2, 3347},
{2, 3, 1093}, {2, 5, 593}, {2, 13, 211}, {2, 19, 179}, {2, 37, 83}, {2, 43, 59}

$\text{SL}_2(\mathbb{F}_{232})$:

{2, 907}, {2, 937}, {2, 953}, {2, 1033}, {2, 1109}, {2, 1361}, {2, 1747}, {2, 2341}, {2, 2423},
{2, 2687}, {2, 2689}, {2, 2917}, {2, 3083}, {2, 3, 929}, {2, 5, 563}, {2, 5, 641}, {2, 7, 419}, {2, 11, 227},
{2, 13, 163}, {2, 13, 251}, {2, 19, 173}, {2, 29, 103}, {2, 31, 83}

$\text{SL}_2(\mathbb{F}_{233})$:

{2, 1237}, {2, 1531}, {2, 1669}, {2, 2089}, {2, 2843}, {2, 5, 449}, {2, 7, 401}, {2, 7, 463}, {2, 11, 239},
{2, 11, 271}, {2, 13, 257}, {2, 31, 103}, {2, 37, 53}

$\text{SL}_2(\mathbb{F}_{234})$:

{2, 883}, {2, 1721}, {2, 1741}, {2, 2081}, {2, 2287}, {2, 2693}, {2, 3257}, {2, 3329}, {2, 3343},
{2, 3389}, {2, 7, 337}, {2, 17, 197}, {2, 19, 107}, {2, 19, 137}, {2, 41, 67}

$\text{SL}_2(\mathbb{F}_{235})$:

{2, 1289}, {2, 1483}, {2, 1609}, {2, 2503}, {2, 2789}, {2, 2999}, {2, 3037}, {2, 3121}, {2, 7, 461},
{2, 13, 233}, {2, 31, 107}

$\text{SL}_2(\mathbb{F}_{236})$:

{2, 1093}, {2, 1553}, {2, 2797}, {2, 2851}, {2, 3121}, {2, 3391}, {2, 5, 479}, {2, 11, 263}

$\underline{\text{SL}_2(\mathbb{F}_{237})}$:

{2, 1259}, {2, 1427}, {2, 1433}, {2, 1759}, {2, 2293}, {2, 2377}, {2, 2713}, {2, 5, 569}, {2, 5, 601},
{2, 7, 479}, {2, 41, 73}

$\underline{\text{SL}_2(\mathbb{F}_{238})}$:

{2, 1087}, {2, 1301}, {2, 1487}, {2, 1499}, {2, 1987}, {2, 2549}, {2, 2903}, {2, 3319}, {2, 3323},
{2, 5, 599}, {2, 13, 239}

$\underline{\text{SL}_2(\mathbb{F}_{239})}$:

{2, 1847}, {2, 1877}, {2, 2069}, {2, 3163}, {2, 3181}, {2, 3, 1049}, {2, 7, 443}, {2, 11, 269},
{2, 23, 127}, {2, 41, 83}

$\underline{\text{SL}_2(\mathbb{F}_{240})}$:

{2, 2297}, {2, 2383}, {2, 2801}, {2, 3067}, {2, 3371}, {2, 7, 487}, {2, 13, 199}, {2, 17, 167},
{2, 23, 131}, {2, 23, 139}, {2, 43, 79}

$\underline{\text{SL}_2(\mathbb{F}_{241})}$:

{2, 1153}, {2, 1543}, {2, 2753}, {2, 2803}, {2, 2851}, {2, 2953}, {2, 3413}, {2, 17, 137}, {2, 17, 181},
{2, 17, 199}, {2, 31, 79}, {2, 31, 101}

$\underline{\text{SL}_2(\mathbb{F}_{242})}$:

{2, 1471}, {2, 1733}, {2, 1783}, {2, 2411}, {2, 3319}, {2, 5, 631}, {2, 7, 367}, {2, 7, 433}, {2, 7, 491},
{2, 29, 83}, {2, 47, 73}

$\underline{\text{SL}_2(\mathbb{F}_{243})}$:

{2, 1481}, {2, 1753}, {2, 2441}, {2, 2741}, {2, 2857}, {2, 11, 307}, {2, 17, 179}, {2, 17, 191}

$\underline{\text{SL}_2(\mathbb{F}_{244})}$:

{2, 1303}, {2, 1951}, {2, 2111}, {2, 2129}, {2, 2381}, {2, 2677}, {2, 2861}, {2, 3361}, {2, 7, 421},
{2, 47, 61}

$\underline{\text{SL}_2(\mathbb{F}_{245})}$:

{2, 1697}, {2, 1913}, {2, 3019}, {2, 3203}, {2, 3301}, {2, 5, 617}

$\underline{\text{SL}_2(\mathbb{F}_{246})}$:

{2, 1597}, {2, 1619}, {2, 1801}, {2, 2017}, {2, 2153}, {2, 2179}, {2, 2251}, {2, 2399}, {2, 3361},
{2, 13, 263}

$\underline{\text{SL}_2(\mathbb{F}_{247})}$:

{2, 2203}, {2, 2273}, {2, 2447}, {2, 2459}, {2, 2687}, {2, 2749}, {2, 3049}, {2, 37, 71}

$\underline{\text{SL}_2(\mathbb{F}_{248})}$:

{2, 1373}, {2, 1451}, {2, 2011}, {2, 2087}, {2, 2099}, {2, 2803}, {2, 2957}

$\underline{\text{SL}_2(\mathbb{F}_{249})}$:

{2, 1321}, {2, 1579}, {2, 3167}, {2, 3259}, {2, 3433}, {2, 11, 293}, {2, 29, 107}

$\underline{\text{SL}_2(\mathbb{F}_{250})}$:

{2, 1549}, {2, 1583}, {2, 1787}, {2, 1999}, {2, 2389}, {2, 2393}, {2, 2593}, {2, 2609}, {2, 11, 281}

$\underline{\text{SL}_2(\mathbb{F}_{251})}$:

{2, 1523}, {2, 1871}, {2, 1931}, {2, 1949}, {2, 2333}, {2, 2341}, {2, 2789}, {2, 3119}, {2, 3181},
{2, 3433}

$\underline{\text{SL}_2(\mathbb{F}_{252})}$:

{2, 1627}, {2, 1831}, {2, 1907}, {2, 2269}, {2, 2729}, {2, 3067}, {2, 43, 73}

$\underline{\text{SL}_2(\mathbb{F}_{253})}$:

{2, 1489}, {2, 2339}, {2, 2351}, {2, 23, 137}

$\underline{\text{SL}_2(\mathbb{F}_{254})}$:

{2, 1709}, {2, 1723}, {2, 1973}, {2, 2347}, {2, 2377}, {2, 2477}, {2, 2801}, {2, 3329}, {2, 43, 67}

$\underline{\text{SL}_2(\mathbb{F}_{255})}$:

{2, 1933}, {2, 2039}, {2, 2131}, {2, 2719}, {2, 2909}, {2, 3049}, {2, 3221}, {2, 13, 241}, {2, 29, 113}

$\underline{\text{SL}_2(\mathbb{F}_{256})}$:

{2, 3259}, {2, 23, 149}

$\underline{\text{SL}_2(\mathbb{F}_{257})}$:

{2, 1493}, {2, 2837}, {2, 2969}, {2, 3037}

$\underline{\text{SL}_2(\mathbb{F}_{258})}$:

{2, 1789}, {2, 1879}, {2, 2917}, {2, 3301}

$\underline{\text{SL}_2(\mathbb{F}_{259})}$:

{2, 1637}, {2, 3323}, {2, 19, 181}

$\underline{\text{SL}_2(\mathbb{F}_{260})}$:

{2, 2843}

$\underline{\text{SL}_2(\mathbb{F}_{261})}$:

{2, 2357}, {2, 2591}, {2, 2633}, {2, 3389}

$\underline{\text{SL}_2(\mathbb{F}_{262})}$:

{2, 1901}, {2, 2141}, {2, 2309}, {2, 2617}, {2, 2957}, {2, 2963}

$\underline{\text{SL}_2(\mathbb{F}_{263})}$:

{2, 2243}, {2, 2281}, {2, 3079}

$\underline{\mathrm{SL}_2(\mathbb{F}_{264})}$:
{2, 1867}, {2, 2029}, {2, 2371}, {2, 3391}

$\underline{\mathrm{SL}_2(\mathbb{F}_{265})}$:
{2, 2473}, {2, 2953}, {2, 3203}

$\underline{\mathrm{SL}_2(\mathbb{F}_{266})}$:
{2, 2711}

$\underline{\mathrm{SL}_2(\mathbb{F}_{267})}$:
{2, 1777}, {2, 1861}, {2, 3257}

$\underline{\mathrm{SL}_2(\mathbb{F}_{268})}$:
{2, 2137}, {2, 2521}

$\underline{\mathrm{SL}_2(\mathbb{F}_{269})}$:
{2, 1873}, {2, 2659}, {2, 2663}, {2, 2939}

$\underline{\mathrm{SL}_2(\mathbb{F}_{270})}$:
{2, 2213}, {2, 2417}, {2, 2777}

$\underline{\mathrm{SL}_2(\mathbb{F}_{271})}$:
{2, 2731}, {2, 2927}

$\underline{\mathrm{SL}_2(\mathbb{F}_{272})}$:
{2, 2539}, {2, 2551}, {2, 3023}

$\underline{\mathrm{SL}_2(\mathbb{F}_{273})}$:
{2, 2003}, {2, 2467}, {2, 3347}

$\underline{\mathrm{SL}_2(\mathbb{F}_{274})}$:
{2, 2113}, {2, 2221}, {2, 2579}, {2, 2671}, {2, 3001}

$\underline{\mathrm{SL}_2(\mathbb{F}_{275})}$:
{2, 2161}, {2, 3229}

$\underline{\mathrm{SL}_2(\mathbb{F}_{276})}$:
{2, 2239}, {2, 2543}

$\underline{\mathrm{SL}_2(\mathbb{F}_{277})}$:
{2, 3137}

$\underline{\mathrm{SL}_2(\mathbb{F}_{279})}$:
{2, 2267}, {2, 3083}, {2, 3253}, {2, 3331}, {2, 3359}

$$\frac{\text{SL}_2(\mathbb{F}_{280})}{\{2, 2819\}, \{2, 3371\}}$$

$$\frac{\text{SL}_2(\mathbb{F}_{281})}{\{2, 2531\}}$$

$$\frac{\text{SL}_2(\mathbb{F}_{282})}{\{2, 2311\}, \{2, 2879\}, \{2, 3407\}}$$

$$\frac{\text{SL}_2(\mathbb{F}_{284})}{\{2, 2237\}}$$

$$\frac{\text{SL}_2(\mathbb{F}_{285})}{\{2, 2791\}}$$

$$\frac{\text{SL}_2(\mathbb{F}_{286})}{\{2, 2437\}, \{2, 2971\}, \{2, 3209\}}$$

$$\frac{\text{SL}_2(\mathbb{F}_{287})}{\{2, 3187\}}$$

$$\frac{\text{SL}_2(\mathbb{F}_{288})}{\{2, 2647\}}$$

$$\frac{\text{SL}_2(\mathbb{F}_{289})}{\{2, 2707\}, \{2, 3169\}}$$

$$\frac{\text{SL}_2(\mathbb{F}_{290})}{\{2, 2833\}}$$

$$\frac{\text{SL}_2(\mathbb{F}_{291})}{\{2, 2557\}, \{2, 3373\}}$$

$$\frac{\text{SL}_2(\mathbb{F}_{292})}{\{2, 3251\}}$$

$$\frac{\text{SL}_2(\mathbb{F}_{293})}{\{2, 2657\}, \{2, 2887\}}$$

$$\frac{\text{SL}_2(\mathbb{F}_{295})}{\{2, 3011\}, \{2, 3191\}}$$

$$\frac{\text{SL}_2(\mathbb{F}_{296})}{\{2, 2767\}, \{2, 3041\}}$$

$$\frac{\text{SL}_2(\mathbb{F}_{297})}{\{2, 2699\}, \{2, 3089\}, \{2, 3109\}, \{2, 3217\}}$$

$$\frac{\text{SL}_2(\mathbb{F}_{299})}{\{2, 2683\}, \{2, 3271\}}$$

$$\frac{\text{SL}_2(\mathbb{F}_{2101})}{\{2, 2897\}}$$

$$\frac{\text{SL}_2(\mathbb{F}_{2105})}{\{2, 3061\}}$$

$$\frac{\text{SL}_2(\mathbb{F}_{2122})}{\{2, 3307\}}$$

$$\frac{\text{SL}_2(\mathbb{F}_{2127})}{\{2, 3313\}}$$