

# 1 BLT set 1 over GF(19)

Points on the quadric  $x_0^2 + x_1x_2 + x_3x_4$ :

$$P_1 = (0, 1, 0, 0, 0)$$

$$P_2 = (0, 0, 1, 0, 0)$$

$$P_3 = (0, 1, 9, 18, 9)$$

$$P_4 = (0, 1, 7, 9, 14)$$

$$P_5 = (0, 1, 1, 6, 3)$$

$$P_6 = (0, 1, 4, 12, 6)$$

$$P_7 = (0, 1, 17, 2, 1)$$

$$P_8 = (0, 1, 5, 16, 8)$$

$$P_9 = (0, 1, 11, 15, 17)$$

$$P_{10} = (0, 1, 7, 10, 5)$$

$$P_{11} = (0, 1, 5, 3, 11)$$

$$P_{12} = (0, 1, 1, 13, 16)$$

$$P_{13} = (0, 1, 17, 17, 18)$$

$$P_{14} = (0, 1, 6, 11, 15)$$

$$P_{15} = (0, 1, 6, 8, 4)$$

$$P_{16} = (0, 1, 16, 5, 12)$$

$$P_{17} = (0, 1, 4, 7, 13)$$

$$P_{18} = (0, 1, 11, 4, 2)$$

$$P_{19} = (0, 1, 16, 14, 7)$$

$$P_{20} = (0, 1, 9, 1, 10)$$

Stabilizer of order 273600 is generated by:

$$g_1 = \begin{pmatrix} 15 & 0 & 0 & 12 & 13 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 16 & 0 & 0 & 12 & 4 \\ 6 & 0 & 0 & 16 & 12 \end{pmatrix}$$

$$g_2 = \begin{pmatrix} 16 & 0 & 0 & 15 & 2 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 1 & 1 & 6 & 3 \\ 18 & 3 & 0 & 17 & 10 \\ 2 & 6 & 0 & 2 & 17 \end{pmatrix}$$

$$g_3 = \begin{pmatrix} 17 & 0 & 0 & 5 & 7 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 6 & 0 & 0 & 9 & 15 \\ 7 & 0 & 0 & 3 & 9 \end{pmatrix}$$

$$g_4 = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 18 & 0 & 0 & 0 \\ 0 & 0 & 18 & 0 & 0 \\ 0 & 0 & 0 & 18 & 0 \\ 0 & 0 & 0 & 0 & 18 \end{pmatrix}$$

$$g_5 = \begin{pmatrix} 0 & 0 & 0 & 6 & 16 \\ 0 & 18 & 10 & 1 & 10 \\ 0 & 0 & 18 & 0 & 0 \\ 8 & 0 & 10 & 10 & 5 \\ 3 & 0 & 1 & 1 & 10 \end{pmatrix}$$

$$g_6 = \begin{pmatrix} 12 & 0 & 0 & 1 & 9 \\ 0 & 10 & 0 & 0 & 0 \\ 0 & 3 & 2 & 8 & 4 \\ 14 & 2 & 0 & 3 & 17 \\ 10 & 4 & 0 & 11 & 3 \end{pmatrix}$$

$$g_7 = \begin{pmatrix} 17 & 0 & 0 & 14 & 12 \\ 0 & 7 & 0 & 0 & 0 \\ 0 & 0 & 11 & 0 & 0 \\ 13 & 0 & 0 & 9 & 15 \\ 12 & 0 & 0 & 3 & 9 \end{pmatrix}$$

$$g_8 = \begin{pmatrix} 17 & 0 & 0 & 14 & 12 \\ 0 & 17 & 0 & 0 & 0 \\ 0 & 0 & 9 & 0 & 0 \\ 13 & 0 & 0 & 9 & 15 \\ 12 & 0 & 0 & 3 & 9 \end{pmatrix}$$

$$g_9 = \begin{pmatrix} 0 & 0 & 0 & 6 & 16 \\ 0 & 16 & 0 & 0 & 0 \\ 0 & 0 & 6 & 0 & 0 \\ 11 & 0 & 0 & 9 & 14 \\ 16 & 0 & 0 & 18 & 9 \end{pmatrix}$$

Induced action on the BLT-set:

The induced group has order 6840 and is generated by:

$$g_1 = \text{id}$$

$$g_2 = (2, 5)(3, 4)(7, 8)(9, 10)(11, 12)(13, 14)(15, 16)(17, 18)(19, 20)$$

$$g_3 = \text{id}$$

$$g_4 = \text{id}$$

$$g_5 = (1, 3)(5, 6)(7, 8)(9, 11)(10, 15)(12, 16)(13, 20)(14, 17)(18, 19)$$

$$g_6 = (2, 4, 3, 6, 11, 20, 14, 16, 19)(5, 13, 12, 8, 9, 7, 15, 17, 10)$$

$$g_7 = (3, 15, 6)(4, 18, 5)(7, 11, 19)(8, 16, 13)(9, 12, 10)(14, 17, 20)$$

$$g_8 = (3, 10, 19, 6, 12, 11, 15, 9, 7)(4, 16, 17, 5, 8, 14, 18, 13, 20)$$

$$g_9 = (3, 5, 7, 17, 9, 16, 15, 4, 11, 20, 12, 13, 6, 18, 19, 14, 10, 8)$$

Kernel has order 40 and is generated by:

$$b_1 = \begin{pmatrix} 16 & 0 & 0 & 15 & 2 \\ 0 & 18 & 0 & 0 & 0 \\ 0 & 0 & 18 & 0 & 0 \\ 18 & 0 & 0 & 17 & 10 \\ 2 & 0 & 0 & 2 & 17 \end{pmatrix}$$

$$b_2 = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$b_3 = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$$

$$b_4 = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 18 & 0 & 0 & 0 \\ 0 & 0 & 18 & 0 & 0 \\ 0 & 0 & 0 & 18 & 0 \\ 0 & 0 & 0 & 0 & 18 \end{pmatrix}$$

The kernel has 381 orbits on the quadric.

The orbit length are  $[20^{361}, 1^{20}]$

Induced action on orbit  $O_2 = \{3, 40, 1067, 1104, 1141, 1178, 1215, 1252, 1289, 1326, 1363, 1400, 1437, 1474, 1511, 1548, 1585, 1622, 1659, 1696, 1733, 1770, 1807, 1844, 1881, 1918, 1955, 1992, 2029, 2066, 2103, 2140, 2177, 2214, 2251, 2288, 2325, 2362, 2399, 2436, 2473, 2510, 2547, 2584, 2621, 2658, 2695, 2732, 2769, 2806, 2843, 2880, 2917, 2954, 2991, 3028, 3065, 3102, 3139, 3176, 3213, 3250, 3287, 3324, 3361, 3398, 3435, 3472, 3509, 3546, 3583, 3620, 3657, 3694, 3731, 3768, 3805, 3842, 3879, 3916, 3953, 3990, 4027, 4064, 4101, 4138, 4175, 4212, 4249, 4286, 4323, 4360, 4397, 4434, 4471, 4508, 4545, 4582, 4619, 4656, 4693, 4730, 4767, 4804, 4841, 4878, 4915, 4952, 4989, 5026, 5063, 5100, 5137, 5174, 5211, 5248, 5285, 5322, 5359, 5396, 5433, 5470, 5507, 5544, 5581, 5618, 5655, 5692, 5729, 5766, 5803, 5840, 5877, 5914, 5951, 5988, 6025, 6062, 6099, 6136, 6173, 6210, 6247, 6284, 6321, 6358, 6395, 6432, 6469, 6506, 6543, 6580, 6617, 6654, 6691, 6728, 6765, 6802, 6839, 6876, 6913, 6950, 6987, 7024, 7061, 7098, 7135, 7172, 7209, 7246, 7283, 7320, 7357, 7394, 7431, 7468, 7505, 7542, 7579, 7616, 7653, 7690, 7727, 7764, 7801, 7838, 7875, 7912, 7949, 7986, 8023, 8060, 8097, 8134, 8171, 8208, 8245, 8282, 8319, 8356, 8393, 8430, 8467, 8504, 8541, 8578, 8615, 8652, 8689, 8726, 8763, 8800, 8837, 8874, 8911, 8948, 8985, 9022, 9059, 9096, 9133, 9170, 9207, 9244, 9281, 9318, 9355, 9392, 9429, 9466, 9503, 9540, 9577, 9614, 9651, 9688, 9725, 9762, 9799, 9836, 9873, 9910, 9947, 9984, 10021, 10058, 10095, 10132, 10169, 10206, 10243, 10280, 10317, 10354, 10391, 10428, 10465, 10502, 10539, 10576, 10613, 10650, 10687, 10724, 10761, 10798, 10835, 10872, 10909, 10946, 10983, 11020, 11057, 11094, 11131, 11168, 11205, 11242, 11279, 11316, 11353, 11390, 11427, 11464, 11501, 11538, 11575, 11612, 11649, 11686, 11723, 11760, 11797, 11834, 11871, 11908, 11945, 11982, 12019, 12056, 12093, 12130, 12167, 12204, 12241, 12278, 12315, 12352, 12389, 12426, 12463, 12500, 12537, 12574, 12611, 12648, 12685, 12722, 12759, 12796, 12833, 12870, 12907, 12944, 12981, 13018, 13055, 13092, 13129, 13166, 13203, 13240, 13277, 13314, 13351, 13388, 13425, 13462, 13499, 13536, 13573, 13610, 13647, 13684, 13721, 13758, 13795, 13832, 13869, 13906, 13943, 13980, 14017, 14054, 14091, 14128, 14165, 14202, 14239, 14276, 14313, 14350, 14387, 14424, 14461, 14498, 14535, 14572, 14609, 14646, 14683, 14720, 14757, 14794, 14831, 14868, 14905, 14942, 14979, 15016, 15053, 15090, 15127, 15164, 15201, 15238, 15275, 15312, 15349, 15386, 15423, 15460, 15497, 15534, 15571, 15608, 15645, 15682, 15719, 15756, 15793, 15830, 15867, 15904, 15941, 15978, 16015, 16052, 16089, 16126, 16163, 16200, 16237, 16274, 16311, 16348, 16385, 16422, 16459, 16496, 16533, 16570, 16607, 16644, 16681, 16718, 16755, 16792, 16829, 16866, 16903, 16940, 16977, 17014, 17051, 17088, 17125, 17162, 17199, 17236, 17273, 17310, 17347, 17384, 17421, 17458, 17495, 17532, 17569, 17606, 17643, 17680, 17717, 17754, 17791, 17828, 17865, 17902, 17939, 17976, 18013, 18050, 18087, 18124, 18161, 18198, 18235, 18272, 18309, 18346, 18383, 18420, 18457, 18494, 18531, 18568, 18605, 18642, 18679, 18716, 18753, 18790, 18827, 18864, 18901, 18938, 18975, 19012, 19049, 19086, 19123, 19160, 19197, 19234, 19271, 19308, 19345, 19382, 19419, 19456, 19493, 19530, 19567, 19604, 19641, 19678, 19715, 19752, 19789, 19826, 19863, 19900, 19937, 19974, 20011, 20048, 20085, 20122, 20159, 20196, 20233, 20270, 20307, 20344, 20381, 20418, 20455, 20492, 20529, 20566, 20603, 20640, 20677, 20714, 20751, 20788, 20825, 20862, 20899, 20936, 20973, 21010, 21047, 21084, 21121, 21158, 21195, 21232, 21269, 21306, 21343, 21380, 21417, 21454, 21491, 21528, 21565, 21602, 21639, 21676, 21713, 21750, 21787, 21824, 21861, 21898, 21935, 21972, 22009, 22046, 22083, 22120, 22157, 22194, 22231, 22268, 22305, 22342, 22379, 22416, 22453, 22490, 22527, 22564, 22601, 22638, 22675, 22712, 22749, 22786, 22823, 22860, 22897, 22934, 22971, 23008, 23045, 23082, 23119, 23156, 23193, 23230, 23267, 23304, 23341, 23378, 23415, 23452, 23489, 23526, 23563, 23600, 23637, 23674, 23711, 23748, 23785, 23822, 23859, 23896, 23933, 23970, 24007, 24044, 24081, 24118, 24155, 24192, 24229, 24266, 24303, 24340, 24377, 24414, 24451, 24488, 24525, 24562, 24599, 24636, 24673, 24710, 24747, 24784, 24821, 24858, 24895, 24932, 24969, 25006, 25043, 25080, 25117, 25154, 25191, 25228, 25265, 25302, 25339, 25376, 25413, 25450, 25487, 25524, 25561, 25598, 25635, 25672, 25709, 25746, 25783, 25820, 25857, 25894, 25931, 25968, 26005, 26042, 26079, 26116, 26153, 26190, 26227, 26264, 26301, 26338, 26375, 26412, 26449, 26486, 26523, 26560, 26597, 26634, 26671, 26708, 26745, 26782, 26819, 26856, 26893, 26930, 26967, 27004, 27041, 27078, 27115, 27152, 27189, 27226, 27263, 27300, 27337, 27374, 27411, 27448, 27485, 27522, 27559, 27596, 27633, 27670, 27707, 27744, 27781, 27818, 27855, 27892, 27929, 27966, 28003, 28040, 28077, 28114, 28151, 28188, 28225, 28262, 28299, 28336, 28373, 28410, 28447, 28484, 28521, 28558, 28595, 28632, 28669, 28706, 28743, 28780, 28817, 28854, 28891, 28928, 28965, 29002, 29039, 29076, 29113, 29150, 29187, 29224, 29261, 29298, 29335, 29372, 29409, 29446, 29483, 29520, 29557, 29594, 29631, 29668, 29705, 29742, 29779, 29816, 29853, 29890, 29927, 29964, 30001, 30038, 30075, 30112, 30149, 30186, 30223, 30260, 30297, 30334, 30371, 30408, 30445, 30482, 30519, 30556, 30593, 30630, 30667, 30704, 30741, 30778, 30815, 30852, 30889, 30926, 30963, 31000, 31037, 31074, 31111, 31148, 31185, 31222, 31259, 31296, 31333, 31370, 31407, 31444, 31481, 31518, 31555, 31592, 31629, 31666, 31703, 31740, 31777, 31814, 31851, 31888, 31925, 31962, 32000, 32037, 32074, 32111, 32148, 32185, 32222, 32259, 32296, 32333, 32370, 32407, 32444, 32481, 32518, 32555, 32592, 32629, 32666, 32703, 32740, 32777, 32814, 32851, 32888, 32925, 32962, 33000, 33037, 33074, 33111, 33148, 33185, 33222, 33259, 33296, 33333, 33370, 33407, 33444, 33481, 33518, 33555, 33592, 33629, 33666, 33703, 33740, 33777, 33814, 33851, 33888, 33925, 33962, 34000, 34037, 34074, 34111, 34148, 34185, 34222, 34259, 34296, 34333, 34370, 34407, 34444, 34481, 34518, 34555, 34592, 34629, 34666, 34703, 34740, 34777, 34814, 34851, 34888, 34925, 34962, 35000, 35037, 35074, 35111, 35148, 35185, 35222, 35259, 35296, 35333, 35370, 35407, 35444, 35481, 35518, 35555, 35592, 35629, 35666, 35703, 35740, 35777, 35814, 35851, 35888, 35925, 35962, 36000, 36037, 36074, 36111, 36148, 36185, 36222, 36259, 36296, 36333, 36370, 36407, 36444, 36481, 36518, 36555, 36592, 36629, 36666, 36703, 36740, 36777, 36814, 36851, 36888, 36925, 36962, 37000, 37037, 37074, 37111, 37148, 37185, 37222, 37259, 37296, 37333, 37370, 37407, 37444, 37481, 37518, 37555, 37592, 37629, 37666, 37703, 37740, 37777, 37814, 37851, 37888, 37925, 37962, 38000, 38037, 38074, 38111, 38148, 38185, 38222, 38259, 38296, 38333, 38370, 38407, 38444, 38481, 38518, 38555, 38592, 38629, 38666, 38703, 38740, 38777, 38814, 38851, 38888, 38925, 38962, 39000, 39037, 39074, 39111, 39148, 39185, 39222, 39259, 39296, 39333, 39370, 39407, 39444, 39481, 39518, 39555, 39592, 39629, 39666, 39703, 39740, 39777, 39814, 39851, 39888, 39925, 39962, 40000, 40037, 40074, 40111, 40148, 40185, 40222, 40259, 40296, 40333, 40370, 40407, 40444, 40481, 40518, 40555, 40592, 40629, 40666, 40703, 40740, 40777, 40814, 40851, 40888, 40925, 40962, 41000, 41037, 41074, 41111, 41148, 41185, 41222, 41259, 41296, 41333, 41370, 41407, 41444, 41481, 41518, 41555, 41592, 41629, 41666, 41703, 41740, 41777, 41814, 41851, 41888, 41925, 41962, 42000, 42037, 42074, 42111, 42148, 42185, 42222, 42259, 42296, 42333, 42370, 42407, 42444, 42481, 42518, 42555, 42592, 42629, 42666, 42703, 42740, 42777, 42814, 42851, 42888, 42925, 42962, 43000, 43037, 43074, 43111, 43148, 43185, 43222, 43259, 43296, 43333, 43370, 43407, 43444, 43481, 43518, 43555, 43592, 43629, 43666, 43703, 43740, 43777, 43814, 43851, 43888, 43925, 43962, 44000, 44037, 44074, 44111, 44148, 44185, 44222, 44259, 44296, 44333, 44370, 44407, 44444, 44481, 44518, 44555, 44592, 44629, 44666, 44703, 44740, 44777, 44814, 44851, 44888, 44925, 44962, 45000, 45037, 45074, 45111, 45148, 45185, 45222, 45259, 45296, 45333, 45370, 45407, 45444, 45481, 45518, 45555, 45592, 45629, 45666, 45703, 45740, 45777, 45814, 45851, 45888, 45925, 45962, 46000, 46037, 46074, 46111, 46148, 46185, 46222, 46259, 46296, 46333, 46370, 46407, 46444, 46481, 46518, 46555, 46592, 46629, 46666, 46703, 46740, 46777, 46814, 46851, 46888, 46925, 46962, 47000, 47037, 47074, 47111, 47148, 47185, 47222, 47259, 47296, 47333, 47370, 47407, 47444, 47481, 47518, 47555, 47592, 47629, 47666, 47703, 47740, 47777, 47814, 47851, 47888, 47925, 47962, 48000, 48037, 48074, 48111, 48148, 48185, 48222, 48259, 48296, 48333, 48370, 48407, 48444, 48481, 48518, 48555, 48592, 48629, 48666, 48703, 48740, 48777, 48814, 48851, 48888, 48925, 48962, 49000, 49037, 49074, 49111, 49148, 49185, 49222, 49259, 49296, 49333, 49370, 49407, 49444, 49481, 49518, 49555, 49592, 49629, 49666, 49703, 49740, 49777, 49814, 49851, 49888, 49925, 49962, 50000, 50037, 50074, 50111, 50148, 50185, 50222, 50259, 50296, 50333, 50370, 50407, 50444, 50481, 50518, 50555, 50592, 50629, 50666, 50703, 50740, 50777, 50814, 50851, 50888, 50925, 50962, 51000, 51037, 51074, 51111, 51148, 51185, 51222, 51259, 51296, 51333, 51370, 51407, 51444, 51481, 51518, 51555, 51592, 51629, 51666, 51703, 51740, 51777, 51814, 51851, 51888, 51925, 51962, 52000, 52037, 52074, 52111, 52148, 52185, 52222, 52259, 52296, 52333, 52370, 52407, 52444, 52481, 52518, 52555, 52592, 52629, 52666, 52703, 52740, 52777, 52814, 52851, 52888, 52925, 52962, 53000, 53037, 53074, 53111, 53148, 53185, 53222, 53259, 53296, 53333, 53370, 53407, 53444, 53481, 53518, 53555, 53592, 53629, 53666, 53703, 53740, 53777, 53814, 53851, 53888, 53925, 53962, 54000, 54037, 54074, 54111, 54148, 54185, 54222, 54259, 54296, 54333, 54370, 54407, 54444, 54481, 54518, 54555, 54592, 54629, 54666, 54703, 54740, 54777, 54814, 54851, 54888, 54925, 54962, 55000, 55037, 55074, 55111, 55148, 55185, 55222, 55259, 55296, 55333, 55370, 55407, 55444, 55481, 55518, 55555, 55592, 55629, 55666, 55703, 55740, 55777, 55814, 55851, 55888, 55925, 55962, 56000, 56037, 56074, 56111, 56148, 56185, 56222, 56259, 56296, 56333, 56370, 56407, 56444, 56481, 56518, 56555, 56592, 56629, 56666, 56703, 56740, 56777, 56814, 56851, 56888, 56925, 56962, 57000, 57037, 57074, 57111, 57148, 57185, 57222, 57259, 57296, 57333, 57370, 57407, 57444, 57481, 57518, 57555, 57592, 57629, 57666, 57703, 57740, 57777, 57814, 57851, 57888, 57925, 57962, 58000, 58037, 58074, 58111, 58148, 58185, 58222, 58259, 58296, 58333, 58370, 58407, 58444, 58481, 58518, 58555, 58592, 58629, 58666, 58703, 58740, 58777, 58814, 58851, 58888, 58925, 58962, 59000, 59037, 59074, 59111, 59148, 59185, 59222, 59259, 59296, 59333, 59370, 59407, 59444, 59481, 59518, 59555, 59592, 59629, 59666, 59703, 59740, 59777, 59814, 59851, 59888, 59925, 59962, 60000, 60037, 60074, 60111, 60148, 60185, 60222, 60259, 60296, 60333, 60370, 60407, 60444, 60481, 60518, 60555, 60592, 60629, 60666, 60703, 60740, 60777, 60814, 60851, 60888, 60925, 60962, 61000, 61037, 61074, 61111, 61148, 61185, 61222, 61259, 61296, 61333, 61370, 61407, 61444, 61481, 61518, 61555, 61592, 61629, 61666, 61703, 61740, 61777, 61814, 61851, 61888, 61925, 61962, 62000, 62037, 62074, 62111, 62148, 62185, 62222, 62259, 62296, 62333, 62370, 62407, 62444, 62481, 62518, 62555, 62592, 62629, 62666, 62703, 62740, 62777, 62814, 62851, 62888, 62925, 62962, 63000, 63037, 63074, 63111, 63148, 63185, 63222, 63259, 63296, 63333, 63370, 63407, 63444, 63481, 63518, 63555, 63592, 63629, 63666, 63703, 63740, 63777, 63814, 63851, 63888, 63925, 63962, 64000, 64037, 64074, 64111, 64148, 64185, 64222, 64259, 64296, 64333, 64370, 64407, 64444, 64481, 64518, 64555, 64592, 64629, 64666, 64703, 64740, 64777, 64814, 64851, 64888, 64925, 64962, 65000, 65037, 65074, 65111, 65148, 65185, 65222, 65259, 65296, 65333, 65370, 65407, 65444, 65481, 65518, 65555, 65592, 65629, 65666, 65703, 65740, 65777, 65814, 65851, 65888, 65925, 65962, 66000, 66037, 66074, 66111, 66148, 66185, 66222, 66259, 66296, 66333, 66370, 66407, 66444, 66481, 66518, 66555, 66592, 66629, 66666, 66703, 66740, 66777, 66814, 66851, 66888, 66925, 66962, 67000, 6703$