HCURFs for constructions in Class-Uniformly Resolvable Group Divisible Structures II: Frames.

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Abstract

A list of the HCURFs needed for the constructions conatined in [3]

A Appendix

We present some of the HCURFs required for the results in Section 4.1 of [3]. Generally, these are cyclic designs which satisfy the conditions of Theorem 3.4 of [3]. In some cases the triples are common to all classes and we then give them separately at the top. For other cases the triples are given with the class.

A.1 HCURFs of type 4^{9t+1}

We present the family of CURF$_4$ of type 1^{9t+1} with partition $2^{3t}3^t$ for $t = 1$ to 5. The cases $t = 1$ to 100 may be found in [4].

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A CURF_4 of type 1^{10} with partition $2^3 3^1$ (t = 1)

Triples $\{1,2,4\}$

8 :	$\{0,5\}$	$\{6,7\}$	$\{9,3\}$
9 :	$\{0,5\}$	$\{6,8\}$	$\{3,7\}$
9 :	$\{3,7\}$	$\{5,8\}$	$\{6,0\}$

A CURF_4 of type 1^{19} with partition $2^6 3^2$ (t = 2)

Triples $\{0,1,3\}$ $\{2,6,11\}$

10 :	$\{9,17\}$	$\{12,13\}$	$\{4,15\}$	$\{18,5\}$	$\{7,14\}$	$\{8,16\}$
17 :	$\{9,4\}$	$\{16,7\}$	$\{5,13\}$	$\{14,10\}$	$\{12,18\}$	$\{8,15\}$
18 :	$\{8,5\}$	$\{4,16\}$	$\{7,13\}$	$\{9,15\}$	$\{10,17\}$	$\{12,14\}$

A CURF_4 of type 1^{28} with partition $2^9 3^3$ (t = 3)

Triples $\{1,2,4\}$ $\{3,7,12\}$ $\{5,11,18\}$

25 :	$\{0,14\}$	$\{8,20\}$	$\{23,27\}$	$\{10,19\}$	$\{15,26\}$	$\{13,24\}$	$\{22,6\}$	$\{9,17\}$	$\{16,21\}$
20 :	$\{0,14\}$	$\{23,25\}$	$\{13,21\}$	$\{17,6\}$	$\{9,19\}$	$\{16,26\}$	$\{22,10\}$	$\{24,27\}$	$\{8,15\}$
24 :	$\{14,20\}$	$\{27,9\}$	$\{0,13\}$	$\{6,16\}$	$\{8,19\}$	$\{21,22\}$	$\{26,10\}$	$\{17,25\}$	$\{15,23\}$

A CURF_4 of type 1^{37} with partition $2^{12} 3^4$ (t = 4)

Triples $\{0,1,3\}$ $\{2,6,11\}$ $\{4,10,17\}$ $\{5,13,23\}$

9 :	$\{7,28\}$	$\{20,29\}$	$\{32,24\}$	$\{16,34\}$	$\{8,25\}$	$\{15,31\}$	$\{18,30\}$	$\{35,14\}$
	$\{21,33\}$	$\{22,36\}$	$\{26,19\}$	$\{12,27\}$				
32 :	$\{12,16\}$	$\{18,34\}$	$\{15,27\}$	$\{25,26\}$	$\{24,35\}$	$\{29,9\}$	$\{19,8\}$	$\{7,20\}$
	$\{14,28\}$	$\{36,22\}$	$\{21,31\}$	$\{30,33\}$				
35 :	$\{29,7\}$	$\{15,32\}$	$\{8,19\}$	$\{18,33\}$	$\{34,12\}$	$\{9,20\}$	$\{28,16\}$	$\{21,26\}$
	$\{24,30\}$	$\{22,36\}$	$\{25,27\}$	$\{31,14\}$				

A CURF_4 of type 1^{46} with partition $2^{15} 3^5$ (t = 5)

Triples $\{1,2,4\}$ $\{3,7,12\}$ $\{5,11,18\}$ $\{6,14,24\}$ $\{8,19,33\}$

37 :	$\{0,23\}$	$\{20,22\}$	$\{31,36\}$	$\{34,44\}$	$\{35,9\}$	$\{21,43\}$	$\{27,39\}$	$\{13,41\}$
	$\{28,42\}$	$\{17,25\}$	$\{45,29\}$	$\{40,16\}$	$\{26,38\}$	$\{10,32\}$	$\{15,30\}$	
44 :	$\{0,23\}$	$\{13,40\}$	$\{26,10\}$	$\{27,30\}$	$\{21,37\}$	$\{29,36\}$	$\{20,42\}$	$\{17,32\}$
	$\{22,39\}$	$\{16,31\}$	$\{38,9\}$	$\{35,41\}$	$\{34,15\}$	$\{28,43\}$	$\{25,45\}$	
21 :	$\{28,32\}$	$\{36,27\}$	$\{22,35\}$	$\{20,41\}$	$\{37,38\}$	$\{23,40\}$	$\{9,26\}$	$\{45,10\}$
	$\{25,44\}$	$\{39,13\}$	$\{42,16\}$	$\{29,17\}$	$\{30,0\}$	$\{31,43\}$	$\{15,34\}$	

A.2 HCURFs of type 5^{18t+1}

A CURF_5 of type 1^{19} with partition $2^3 3^4$ (t = 1) satisfying λ blowup. Point set $\mathbb{Z}_{19}$. Develop the following 3 partial classes, mod 19

$\{0,1,4\}$	$\{2,3,6\}$	$\{7,8,11\}$	$\{9,10,13\}$	$\{5,15\}$	$\{12,17\}$	$\{14,18\}$
$\{0,2,9\}$	$\{1,3,10\}$	$\{4,6,13\}$	$\{5,7,14\}$	$\{12,15\}$	$\{11,17\}$	$\{8,16\}$
$\{0,5,11\}$	$\{1,6,12\}$	$\{2,7,13\}$	$\{3,8,14\}$	$\{4,16\}$	$\{15,17\}$	$\{9,10\}$

A CURF_5 of type 1^{37} with partition $2^6 3^8$ (t = 2) satisfying λ blowup. Point set $\mathbb{Z}_{37}$. Develop the following 3 partial classes, mod 37

$\{0,1,3\}$	$\{4,5,7\}$	$\{8,9,11\}$	$\{12,13,15\}$	$\{2,6,28\}$	$\{10,14,36\}$	$\{27,31,16\}$
$\{29,33,18\}$	$\{17,20\}$	$\{21,25\}$	$\{34,35\}$	$\{19,24\}$	$\{23,30\}$	$\{22,32\}$

$\{0, 5, 14\}$	$\{1, 6, 15\}$	$\{2, 7, 16\}$	$\{3, 8, 17\}$	$\{4, 10, 29\}$	$\{21, 27, 9\}$	$\{24, 30, 12\}$
$\{25, 31, 13\}$	$\{33, 11\}$	$\{22, 28\}$	$\{18, 32\}$	$\{23, 34\}$	$\{35, 26\}$	$\{20, 36\}$

$\{0, 7, 17\}$	$\{1, 8, 18\}$	$\{2, 9, 19\}$	$\{3, 10, 20\}$	$\{4, 12, 25\}$	$\{5, 13, 26\}$	$\{6, 14, 27\}$
$\{15, 23, 36\}$	$\{34, 16\}$	$\{11, 28\}$	$\{29, 31\}$	$\{24, 32\}$	$\{22, 35\}$	$\{21, 33\}$

A CURF_5 of type 1^{55} with partition $2^9 3^{12}$ (t = 3) satisfying λ blowup. Point set $\mathbb{Z}_{55}$. Develop the following 3 partial classes, mod 55

$\{0, 1, 3\}$	$\{4, 5, 7\}$	$\{8, 9, 11\}$	$\{12, 13, 15\}$	$\{10, 14, 19\}$	$\{16, 20, 25\}$	$\{17, 21, 26\}$
$\{18, 22, 27\}$	$\{23, 29, 39\}$	$\{24, 30, 40\}$	$\{28, 34, 44\}$	$\{31, 37, 47\}$	$\{53, 50\}$	$\{52, 38\}$
$\{6, 32\}$	$\{2, 36\}$	$\{33, 41\}$	$\{45, 46\}$	$\{42, 54\}$	$\{49, 51\}$	$\{35, 48\}$

$\{0, 7, 32\}$	$\{1, 8, 33\}$	$\{2, 9, 34\}$	$\{3, 10, 35\}$	$\{11, 19, 40\}$	$\{12, 20, 41\}$	$\{13, 21, 42\}$
$\{14, 22, 43\}$	$\{4, 15, 46\}$	$\{5, 16, 47\}$	$\{6, 17, 48\}$	$\{38, 49, 25\}$	$\{37, 44\}$	$\{24, 29\}$
$\{39, 30\}$	$\{18, 53\}$	$\{51, 26\}$	$\{27, 50\}$	$\{52, 28\}$	$\{36, 54\}$	$\{45, 23\}$

$\{0, 12, 27\}$	$\{1, 13, 28\}$	$\{2, 14, 29\}$	$\{3, 15, 30\}$	$\{4, 18, 40\}$	$\{5, 19, 41\}$	$\{6, 20, 42\}$
$\{7, 21, 43\}$	$\{8, 25, 45\}$	$\{9, 26, 46\}$	$\{16, 33, 53\}$	$\{17, 34, 54\}$	$\{50, 23\}$	$\{22, 11\}$
$\{36, 52\}$	$\{44, 38\}$	$\{10, 48\}$	$\{32, 51\}$	$\{35, 31\}$	$\{47, 37\}$	$\{24, 39\}$

A.3 HCURFs of type 5^{24t+1}

A CURF_5 of type 1^{25} with partition $2^9 3^2$ (t = 1)

$$\text{Triples} \quad \{0,1,3\} \quad \{2,6,11\}$$

24 :	$\{12, 22\}$	$\{13, 23\}$	$\{8, 19\}$	$\{15, 10\}$	$\{9, 21\}$	$\{14, 18\}$	$\{5, 17\}$	$\{20, 7\}$	$\{4, 16\}$
24 :	$\{12, 23\}$	$\{8, 19\}$	$\{13, 20\}$	$\{9, 17\}$	$\{14, 21\}$	$\{18, 10\}$	$\{5, 16\}$	$\{4, 22\}$	$\{7, 15\}$
13 :	$\{21, 7\}$	$\{12, 15\}$	$\{17, 18\}$	$\{4, 23\}$	$\{24, 5\}$	$\{9, 19\}$	$\{14, 20\}$	$\{10, 8\}$	$\{16, 22\}$
22 :	$\{9, 19\}$	$\{12, 20\}$	$\{4, 13\}$	$\{18, 5\}$	$\{23, 8\}$	$\{21, 15\}$	$\{7, 14\}$	$\{10, 17\}$	$\{16, 24\}$

A CURF_5 of type 1^{49} with partition $2^{18} 3^4$ (t = 2)

$$\text{Triples} \quad \{0,1,3\} \quad \{2,6,11\} \quad \{4,10,17\} \quad \{5,13,23\}$$

46 :	$\{18, 25\}$	$\{47, 12\}$	$\{33, 7\}$	$\{29, 44\}$	$\{35, 38\}$	$\{40, 15\}$	$\{16, 30\}$	$\{9, 21\}$
	$\{8, 28\}$	$\{32, 43\}$	$\{24, 41\}$	$\{14, 37\}$	$\{20, 39\}$	$\{22, 42\}$	$\{26, 34\}$	$\{27, 31\}$
	$\{45, 19\}$	$\{36, 48\}$						
44 :	$\{40, 15\}$	$\{7, 24\}$	$\{31, 41\}$	$\{14, 29\}$	$\{28, 42\}$	$\{36, 9\}$	$\{45, 20\}$	$\{35, 8\}$
	$\{27, 46\}$	$\{26, 43\}$	$\{30, 47\}$	$\{25, 39\}$	$\{16, 32\}$	$\{22, 33\}$	$\{18, 38\}$	$\{21, 19\}$
	$\{37, 12\}$	$\{34, 48\}$						
7 :	$\{21, 45\}$	$\{40, 12\}$	$\{14, 35\}$	$\{26, 37\}$	$\{42, 15\}$	$\{48, 27\}$	$\{28, 34\}$	$\{8, 20\}$
	$\{38, 29\}$	$\{31, 47\}$	$\{19, 39\}$	$\{18, 36\}$	$\{43, 44\}$	$\{22, 33\}$	$\{41, 25\}$	$\{30, 46\}$
	$\{24, 9\}$	$\{16, 32\}$						
32 :	$\{20, 40\}$	$\{14, 35\}$	$\{24, 43\}$	$\{16, 37\}$	$\{18, 30\}$	$\{28, 47\}$	$\{26, 41\}$	$\{7, 39\}$
	$\{38, 12\}$	$\{48, 22\}$	$\{8, 44\}$	$\{46, 19\}$	$\{9, 31\}$	$\{29, 34\}$	$\{21, 33\}$	$\{45, 15\}$
	$\{27, 42\}$	$\{25, 36\}$						

A.4 HCURFs of type 6^{2t+1}

We give an HCURF of type 6^{2t+1} for $t = 3, 4, 5, 6$, corresponding to $u = 7, 9, 11, 13$, $t = 2$ ($u = 5$) is given in the text. This is a generating set for $u \equiv 1 \bmod 2$ [1], with the 20 possible exceptions:

$$u \in \{43, 51, 59, 71, 75, 83, 87, 95, 107, 111, 115, 119, 131, 135, 139, 167, 179, 183, 191, 195\}.$$

A CURF of type 6^7 with partition $2^9 3^6$ (t = 3) Point set $\mathbb{Z}_6 \times \mathbb{Z}_7$, groups $\mathbb{Z}_6 \times \{i\}, i \in \mathbb{Z}_7$. Develop the following 4 classes, each missing group $\mathbb{Z}_6 \times \{0\}$, $\mathrm{mod}(-, 7)$

$\{(2, 5), (0, 4), (1, 6)\}$	$\{(1, 1), (5, 3), (4, 6)\}$	$\{(3, 3), (2, 2), (0, 6)\}$	$\{(2, 1), (1, 3), (3, 6)\}$
$\{(5, 6), (3, 2), (2, 3)\}$	$\{(4, 2), (0, 1), (5, 4)\}$	$\{(4, 5), (4, 4)\}$	$\{(4, 3), (3, 4)\}$
$\{(0, 2), (4, 1)\}$	$\{(2, 4), (2, 6)\}$	$\{(0, 3), (0, 5)\}$	$\{(1, 2), (1, 4)\}$
$\{(1, 5), (5, 2)\}$	$\{(5, 1), (5, 5)\}$	$\{(3, 5), (3, 1)\}$	

{(3, 3), (1, 4), (5, 5)}	{(4, 4), (0, 2), (1, 1)}	{(1, 5), (5, 3), (4, 2)}	{(1, 6), (2, 2), (0, 3)}
{(3, 1), (5, 6), (1, 3)}	{(5, 1), (0, 6), (2, 3)}	{(2, 4), (1, 2)}	{(0, 4), (0, 5)}
{(5, 4), (5, 2)}	{(4, 3), (4, 6)}	{(2, 6), (3, 2)}	{(2, 5), (2, 1)}
{(0, 1), (4, 5)}	{(3, 5), (3, 6)}	{(3, 4), (4, 1)}	

{(4, 5), (5, 3), (2, 6)}	{(2, 5), (4, 2), (1, 1)}	{(5, 2), (3, 6), (0, 3)}	{(4, 6), (3, 1), (1, 4)}
{(1, 3), (0, 2), (2, 4)}	{(0, 6), (5, 4), (3, 5)}	{(5, 1), (1, 2)}	{(3, 2), (3, 4)}
{(0, 4), (2, 2)}	{(1, 6), (0, 1)}	{(5, 5), (2, 3)}	{(2, 1), (3, 3)}
{(1, 5), (4, 4)}	{(0, 5), (5, 6)}	{(4, 1), (4, 3)}	

{(3, 2), (1, 1), (0, 4)}	{(3, 3), (0, 1), (4, 6)}	{(2, 1), (5, 2), (4, 3)}	{(2, 4), (3, 1), (4, 2)}
{(4, 5), (5, 1), (2, 2)}	{(3, 6), (4, 1), (0, 5)}	{(0, 3), (0, 6)}	{(0, 2), (5, 6)}
{(1, 5), (1, 4)}	{(4, 4), (2, 3)}	{(5, 3), (5, 4)}	{(1, 3), (3, 5)}
{(3, 4), (5, 5)}	{(1, 6), (1, 2)}	{(2, 5), (2, 6)}	

A CURF of type 6^9 with partition $2^{12}3^8$ (t = 4) Point set $\mathbb{Z}_6 \times \mathbb{Z}_9$, groups $\mathbb{Z}_6 \times \{i\}, i \in \mathbb{Z}_9$. Develop the following 4 classes, each missing group $\mathbb{Z}_6 \times \{0\}$, $\mathrm{mod}(-, 9)$

{(5, 7), (2, 1), (4, 2)}	{(2, 5), (4, 3), (0, 1)}	{(1, 4), (0, 3), (4, 6)}	{(5, 5), (1, 1), (2, 7)}
{(0, 8), (3, 3), (4, 4)}	{(1, 3), (0, 4), (3, 7)}	{(3, 1), (5, 3), (2, 2)}	{(2, 4), (5, 8), (1, 5)}
{(4, 1), (3, 5)}	{(0, 2), (0, 5)}	{(1, 8), (0, 6)}	{(5, 6), (5, 1)}
{(4, 7), (1, 2)}	{(0, 7), (2, 8)}	{(3, 6), (3, 8)}	{(5, 4), (5, 2)}
{(3, 2), (4, 8)}	{(4, 5), (2, 3)}	{(1, 6), (1, 7)}	{(3, 4), (2, 6)}

{(4, 8), (1, 4), (2, 5)}	{(0, 1), (1, 7), (5, 4)}	{(2, 1), (3, 2), (4, 6)}	{(5, 8), (1, 1), (0, 6)}
{(0, 2), (2, 4), (4, 1)}	{(5, 6), (4, 3), (0, 5)}	{(0, 7), (3, 8), (5, 5)}	{(4, 2), (5, 1), (3, 3)}
{(0, 4), (1, 2)}	{(3, 1), (0, 3)}	{(3, 4), (2, 2)}	{(5, 3), (5, 2)}
{(2, 8), (2, 7)}	{(5, 7), (1, 6)}	{(2, 3), (2, 6)}	{(3, 7), (3, 6)}
{(3, 5), (0, 8)}	{(4, 7), (4, 5)}	{(1, 3), (4, 4)}	{(1, 5), (1, 8)}

{(1, 1), (0, 7), (4, 8)}	{(2, 2), (1, 7), (3, 6)}	{(3, 7), (5, 1), (0, 5)}	{(4, 7), (2, 3), (5, 8)}
{(3, 4), (5, 5), (1, 6)}	{(5, 7), (4, 3), (0, 8)}	{(3, 3), (0, 4), (2, 7)}	{(1, 2), (4, 1), (3, 8)}
{(0, 6), (5, 3)}	{(5, 6), (3, 1)}	{(0, 3), (2, 8)}	{(3, 5), (3, 2)}
{(2, 1), (2, 5)}	{(1, 8), (1, 4)}	{(4, 2), (5, 4)}	{(0, 2), (0, 1)}
{(1, 5), (1, 3)}	{(4, 6), (4, 5)}	{(5, 2), (4, 4)}	{(2, 6), (2, 4)}

{(4, 7), (2, 8), (0, 1)}	{(3, 8), (4, 6), (5, 3)}	{(3, 3), (5, 2), (0, 7)}	{(1, 4), (3, 7), (4, 1)}
{(1, 5), (3, 6), (2, 3)}	{(2, 1), (0, 2), (1, 7)}	{(1, 2), (3, 4), (2, 7)}	{(2, 5), (5, 8), (1, 3)}
{(1, 1), (4, 4)}	{(1, 8), (5, 1)}	{(2, 6), (5, 5)}	{(3, 1), (3, 5)}
{(0, 4), (0, 6)}	{(5, 4), (5, 7)}	{(0, 5), (2, 2)}	{(5, 6), (2, 4)}
{(0, 8), (0, 3)}	{(4, 3), (4, 8)}	{(3, 2), (1, 6)}	{(4, 5), (4, 2)}

A CURF of type 6^{11} with partition $2^{15}3^{10}$ (t = 5) Point set $\mathbb{Z}_6 \times \mathbb{Z}_{11}$, groups $\mathbb{Z}_6 \times \{i\}, i \in \mathbb{Z}_{11}$. Develop the following 4 classes, each missing group $\mathbb{Z}_6 \times \{0\}$, $\mathrm{mod}(-, 11)$

{(1, 8), (0, 1), (4, 4)}	{(1, 1), (3, 2), (0, 3)}	{(1, 4), (1, 9), (2, 10)}	{(5, 7), (4, 8), (5, 6)}
{(3, 10), (2, 5), (2, 4)}	{(5, 4), (4, 7), (0, 9)}	{(5, 1), (2, 8), (3, 7)}	{(0, 8), (3, 5), (3, 4)}
{(3, 1), (3, 8), (1, 6)}	{(5, 8), (2, 1), (1, 10)}	{(5, 3), (0, 7)}	{(3, 3), (0, 2)}
{(2, 6), (4, 9)}	{(4, 10), (5, 5)}	{(1, 3), (5, 9)}	{(2, 2), (1, 5)}
{(3, 6), (4, 5)}	{(0, 10), (4, 6)}	{(5, 2), (0, 5)}	{(2, 3), (2, 9)}
{(0, 4), (4, 3)}	{(0, 6), (3, 9)}	{(2, 7), (5, 10)}	{(4, 2), (1, 7)}
{(4, 1), (1, 2)}			

{(1, 4), (1, 7), (0, 10)}	{(1, 2), (0, 7), (1, 6)}	{(5, 7), (3, 4), (2, 2)}	{(1, 9), (4, 7), (3, 1)}
{(5, 3), (0, 1), (0, 5)}	{(5, 8), (4, 6), (2, 10)}	{(4, 2), (4, 9), (3, 6)}	{(5, 9), (5, 6), (1, 10)}
{(2, 7), (0, 4), (2, 9)}	{(4, 1), (4, 4), (3, 10)}	{(4, 3), (0, 2)}	{(5, 5), (5, 10)}
{(1, 5), (5, 2)}	{(2, 3), (3, 7)}	{(0, 9), (2, 5)}	{(5, 4), (3, 2)}
{(3, 3), (3, 5)}	{(4, 10), (0, 8)}	{(3, 8), (2, 1)}	{(0, 6), (2, 8)}
{(5, 1), (2, 4)}	{(1, 8), (2, 6)}	{(1, 3), (4, 5)}	{(4, 8), (0, 3)}
{(3, 9), (1, 1)}			

{(4, 2), (1, 8), (1, 9)}	{(5, 4), (5, 2), (4, 1)}	{(4, 10), (3, 9), (3, 6)}	{(0, 3), (0, 4), (1, 7)}
{(4, 5), (4, 4), (2, 3)}	{(0, 1), (0, 7), (2, 5)}	{(2, 4), (1, 1), (5, 6)}	{(5, 8), (3, 10), (2, 7)}
{(2, 1), (5, 7), (1, 5)}	{(1, 4), (2, 9), (4, 7)}	{(4, 6), (0, 2)}	{(4, 9), (2, 10)}
{(3, 2), (1, 6)}	{(0, 9), (1, 10)}	{(0, 6), (5, 10)}	{(0, 8), (0, 5)}
{(5, 9), (3, 1)}	{(2, 6), (3, 4)}	{(5, 1), (5, 5)}	{(1, 3), (3, 7)}
{(3, 5), (2, 8)}	{(3, 3), (0, 10)}	{(4, 8), (2, 2)}	{(1, 2), (4, 3)}
{(3, 8), (5, 3)}			

{(4, 8), (5, 2), (2, 3)}	{(5, 8), (0, 9), (3, 7)}	{(4, 5), (4, 7), (0, 10)}	{(0, 3), (2, 2), (0, 5)}
{(3, 4), (3, 9), (1, 10)}	{(4, 9), (5, 5), (3, 1)}	{(0, 7), (2, 8), (1, 9)}	{(2, 6), (4, 3), (2, 10)}
{(3, 8), (0, 2), (5, 7)}	{(0, 8), (5, 9), (3, 2)}	{(5, 3), (1, 2)}	{(1, 5), (4, 2)}
{(4, 10), (4, 4)}	{(2, 4), (2, 7)}	{(4, 6), (5, 10)}	{(4, 1), (3, 3)}
{(1, 1), (2, 5)}	{(0, 1), (5, 4)}	{(5, 1), (1, 8)}	{(2, 9), (3, 10)}
{(1, 3), (5, 6)}	{(1, 7), (3, 5)}	{(2, 1), (0, 6)}	{(0, 4), (3, 6)}
{(1, 4), (1, 6)}			

A CURF of type 6^{13} with partition $2^{18}3^{12}$ (t = 6) Point set $\mathbb{Z}_6 \times \mathbb{Z}_{13}$, groups $\mathbb{Z}_6 \times \{i\}, i \in \mathbb{Z}_{13}$. Develop the following 4 classes, each missing group $\mathbb{Z}_6 \times \{0\}$, $\mathrm{mod}(-, 13)$

$\{(1,5),(4,4),(5,10)\}$	$\{(3,5),(3,9),(2,11)\}$	$\{(4,7),(0,1),(0,2)\}$	$\{(4,9),(3,4),(3,7)\}$
$\{(4,11),(2,8),(3,12)\}$	$\{(5,2),(4,6),(0,5)\}$	$\{(5,7),(1,12),(1,1)\}$	$\{(1,8),(4,1),(4,12)\}$
$\{(2,10),(5,4),(0,6)\}$	$\{(3,3),(1,11),(3,10)\}$	$\{(2,2),(1,9),(2,1)\}$	$\{(2,5),(0,7),(5,6)\}$
$\{(1,4),(3,11)\}$	$\{(1,3),(3,1)\}$	$\{(0,10),(4,5)\}$	$\{(0,8),(1,10)\}$
$\{(0,4),(2,7)\}$	$\{(2,3),(5,5)\}$	$\{(4,2),(5,3)\}$	$\{(2,4),(1,6)\}$
$\{(3,2),(0,9)\}$	$\{(4,8),(5,12)\}$	$\{(5,8),(2,9)\}$	$\{(0,11),(5,1)\}$
$\{(0,3),(5,9)\}$	$\{(5,11),(3,6)\}$	$\{(3,8),(1,7)\}$	$\{(2,6),(2,12)\}$
$\{(4,10),(1,2)\}$	$\{(4,3),(0,12)\}$		

$\{(0,4),(4,3),(1,11)\}$	$\{(4,4),(4,12),(5,9)\}$	$\{(1,2),(1,7),(3,11)\}$	$\{(3,2),(5,1),(3,4)\}$
$\{(2,7),(2,11),(3,12)\}$	$\{(2,1),(2,4),(1,5)\}$	$\{(5,4),(5,11),(5,2)\}$	$\{(3,5),(5,3),(0,2)\}$
$\{(3,10),(4,5),(4,11)\}$	$\{(2,10),(2,8),(5,5)\}$	$\{(1,9),(1,10),(0,6)\}$	$\{(0,1),(3,8),(5,10)\}$
$\{(0,8),(3,3)\}$	$\{(2,6),(4,2)\}$	$\{(1,1),(2,3)\}$	$\{(3,9),(1,12)\}$
$\{(0,10),(2,2)\}$	$\{(2,5),(0,3)\}$	$\{(5,6),(4,8)\}$	$\{(0,5),(5,12)\}$
$\{(3,1),(4,7)\}$	$\{(0,12),(4,1)\}$	$\{(4,10),(1,3)\}$	$\{(0,11),(1,8)\}$
$\{(2,12),(3,7)\}$	$\{(1,4),(5,7)\}$	$\{(3,6),(0,7)\}$	$\{(4,6),(0,9)\}$
$\{(1,6),(2,9)\}$	$\{(5,8),(4,9)\}$		

$\{(5,5),(0,1),(2,2)\}$	$\{(2,12),(3,8),(4,4)\}$	$\{(5,1),(1,12),(1,2)\}$	$\{(4,7),(1,9),(2,10)\}$
$\{(1,1),(0,5),(0,8)\}$	$\{(5,4),(4,9),(2,11)\}$	$\{(2,1),(0,7),(3,3)\}$	$\{(1,8),(4,10),(0,3)\}$
$\{(2,7),(4,8),(0,12)\}$	$\{(3,10),(1,4),(0,6)\}$	$\{(5,7),(5,2),(1,6)\}$	$\{(3,1),(5,9),(5,10)\}$
$\{(4,2),(2,9)\}$	$\{(1,11),(4,1)\}$	$\{(1,10),(2,4)\}$	$\{(3,11),(1,3)\}$
$\{(0,10),(3,12)\}$	$\{(5,3),(0,11)\}$	$\{(0,2),(2,8)\}$	$\{(5,11),(3,5)\}$
$\{(2,6),(0,9)\}$	$\{(2,5),(3,4)\}$	$\{(3,2),(4,12)\}$	$\{(4,11),(2,3)\}$
$\{(4,6),(5,8)\}$	$\{(3,7),(3,6)\}$	$\{(5,12),(4,5)\}$	$\{(0,4),(1,5)\}$
$\{(5,6),(4,3)\}$	$\{(3,9),(1,7)\}$		

$\{(2,8),(1,11),(4,7)\}$	$\{(0,12),(0,6),(0,1)\}$	$\{(2,1),(4,5),(3,11)\}$	$\{(4,8),(2,6),(0,10)\}$
$\{(0,4),(0,8),(3,5)\}$	$\{(2,4),(3,10),(0,5)\}$	$\{(5,8),(3,4),(5,11)\}$	$\{(1,1),(0,2),(1,10)\}$
$\{(2,10),(2,5),(5,1)\}$	$\{(3,1),(4,12),(3,9)\}$	$\{(4,1),(4,11),(4,2)\}$	$\{(5,10),(1,6),(1,12)\}$
$\{(1,7),(4,4)\}$	$\{(3,6),(2,3)\}$	$\{(5,6),(0,11)\}$	$\{(5,7),(2,2)\}$
$\{(1,9),(5,3)\}$	$\{(5,9),(2,11)\}$	$\{(1,8),(4,9)\}$	$\{(3,3),(5,4)\}$
$\{(3,2),(4,6)\}$	$\{(2,9),(4,3)\}$	$\{(1,3),(2,7)\}$	$\{(3,12),(5,2)\}$
$\{(0,3),(5,5)\}$	$\{(1,5),(3,8)\}$	$\{(1,4),(2,12)\}$	$\{(3,7),(0,9)\}$
$\{(5,12),(1,2)\}$	$\{(0,7),(4,10)\}$		

A.5 HCURFs of type 7^{8t+1}

For $t \in \{2,3,4,5,6,7,8,11,12,13,14,15,16\}$ we give a CURF$_7$ of type 1^{8t+1} with partition 2^t3^{2t} satisfying λ blow-up (Theorem 3.4 in [3]), $t = 1, u = 9$ is given by Theorem 4.14 of [3]. This corresponds to the generating set $u \in \{9,17,25,33,41,49,57,65,89,97,105,113,121,129\}$ from [2], leaving 66 possible exceptions. In each case we give 4 partial classes over the point set $\mathbb{Z}_{8t+1}$, each missing one point. The design is obtained by developing these 4 partial classes mod $8t+1$.

$t = 2, u = 17$

$\{0,6,4\}$ $\{2,7,10\}$ $\{5,8,13\}$ $\{11,1,12\}$ $\{9,15\}$ $\{14,16\}$

$\{0,8,1\}$ $\{3,9,5\}$ $\{6,10,7\}$ $\{12,14,2\}$ $\{13,4\}$ $\{11,15\}$

$\{0,6,4\}$ $\{2,7,10\}$ $\{5,8,13\}$ $\{11,1,12\}$ $\{9,14\}$ $\{15,16\}$

$\{0,8,1\}$ $\{3,9,5\}$ $\{6,10,7\}$ $\{12,14,2\}$ $\{13,16\}$ $\{11,4\}$

$t = 3, u = 25$

$\{0,1,3\}$ $\{2,6,13\}$ $\{4,9,17\}$ $\{5,11,20\}$ $\{7,8,10\}$ $\{12,16,23\}$ $\{14,18\}$
$\{19,22\}$ $\{15,21\}$

$\{0,1,3\}$ $\{2,6,13\}$ $\{4,9,17\}$ $\{5,11,20\}$ $\{10,15,23\}$ $\{16,22,7\}$ $\{24,19\}$
$\{12,14\}$ $\{18,8\}$

$\{0,1,3\}$ $\{2,6,13\}$ $\{4,9,17\}$ $\{5,11,20\}$ $\{7,8,10\}$ $\{12,16,23\}$ $\{19,18\}$
$\{14,22\}$ $\{24,15\}$

$\{0,1,3\}$ $\{2,6,13\}$ $\{4,9,17\}$ $\{5,11,20\}$ $\{10,15,23\}$ $\{16,22,7\}$ $\{12,24\}$
$\{14,21\}$ $\{8,19\}$

$t = 4, u = 33$

$\{1,2,4\}$ $\{5,6,8\}$ $\{9,10,12\}$ $\{3,7,13\}$ $\{14,18,24\}$ $\{15,23,32\}$ $\{16,20,26\}$
$\{0,11,22\}$ $\{27,17\}$ $\{28,25\}$ $\{21,29\}$ $\{19,30\}$

$\{0,5,18\}$ $\{1,6,19\}$ $\{2,7,20\}$ $\{3,10,22\}$ $\{4,11,23\}$ $\{8,15,27\}$ $\{9,17,26\}$
$\{13,21,30\}$ $\{28,12\}$ $\{14,32\}$ $\{16,25\}$ $\{24,31\}$

{1, 2, 4}	{5, 6, 8}	{9, 10, 12}	{3, 7, 13}	{14, 18, 24}	{15, 23, 32}	{16, 20, 26}
{0, 11, 22}	{27, 28}	{30, 25}	{19, 21}	{17, 31}		

{0, 5, 18}	{1, 6, 19}	{2, 7, 20}	{3, 10, 22}	{4, 11, 23}	{8, 15, 27}	{9, 17, 26}
{13, 21, 30}	{16, 29}	{32, 28}	{12, 24}	{25, 31}		

$t = 5, u = 41$

{0, 15, 19}	{1, 3, 17}	{4, 11, 21}	{2, 8, 20}	{7, 18, 10}	{5, 23, 22}	{9, 29, 24}
{13, 25, 32}	{26, 35, 39}	{37, 6, 12}	{16, 34}	{30, 14}	{28, 40}	{27, 38}
{31, 33}						

{0, 11, 8}	{1, 18, 20}	{2, 10, 22}	{4, 9, 13}	{3, 16, 17}	{12, 15, 30}	{5, 19, 21}
{14, 23, 24}	{27, 40, 6}	{26, 31, 37}	{39, 32}	{28, 36}	{25, 35}	{7, 33}
{29, 38}						

{0, 15, 19}	{1, 3, 17}	{4, 11, 21}	{2, 8, 20}	{7, 18, 10}	{5, 23, 22}	{9, 29, 24}
{13, 25, 32}	{26, 35, 39}	{37, 6, 12}	{30, 33}	{34, 28}	{38, 16}	{40, 27}
{31, 14}						

{0, 11, 8}	{1, 18, 20}	{2, 10, 22}	{4, 9, 13}	{3, 16, 17}	{12, 15, 30}	{5, 19, 21}
{14, 23, 24}	{27, 40, 6}	{26, 31, 37}	{28, 7}	{34, 35}	{32, 36}	{39, 25}
{33, 38}						

$t = 6, u = 49$

{0, 1, 3}	{4, 5, 7}	{8, 9, 11}	{6, 10, 15}	{12, 16, 21}	{13, 17, 22}	{14, 20, 31}
{18, 24, 35}	{19, 26, 42}	{23, 30, 46}	{27, 33, 44}	{25, 32, 48}	{47, 38}	{34, 41}
{29, 37}	{36, 2}	{39, 43}	{28, 40}			

{0, 8, 30}	{1, 9, 31}	{2, 10, 32}	{3, 13, 34}	{4, 14, 35}	{5, 15, 36}	{6, 20, 40}
{7, 19, 43}	{11, 25, 45}	{12, 24, 48}	{29, 41, 16}	{33, 47, 18}	{44, 17}	{21, 27}
{28, 38}	{26, 46}	{39, 22}	{23, 37}			

{0, 1, 3}	{4, 5, 7}	{8, 9, 11}	{6, 10, 15}	{12, 16, 21}	{13, 17, 22}	{14, 20, 31}
{18, 24, 35}	{19, 26, 42}	{23, 30, 46}	{27, 33, 44}	{25, 32, 48}	{36, 39}	{34, 47}
{41, 43}	{37, 38}	{29, 45}	{2, 28}			

{0, 8, 30}	{1, 9, 31}	{2, 10, 32}	{3, 13, 34}	{4, 14, 35}	{5, 15, 36}	{6, 20, 40}
{7, 19, 43}	{11, 25, 45}	{12, 24, 48}	{29, 41, 16}	{33, 47, 18}	{44, 26}	{22, 27}
{46, 21}	{42, 23}	{28, 39}	{17, 38}			

$t = 7, u = 57$

{1, 2, 4}	{5, 6, 8}	{9, 10, 12}	{7, 11, 16}	{13, 17, 22}	{14, 18, 23}	{15, 21, 28}
{20, 26, 33}	{24, 32, 50}	{29, 35, 42}	{44, 56, 27}	{48, 3, 31}	{41, 55, 25}	{0, 19, 38}
{30, 49}	{39, 54}	{45, 53}	{40, 46}	{51, 52}	{36, 43}	{34, 37}

{0, 8, 26}	{1, 9, 27}	{2, 12, 35}	{3, 13, 36}	{4, 14, 37}	{6, 17, 38}	{7, 18, 39}
{10, 21, 42}	{11, 23, 51}	{5, 20, 40}	{15, 30, 50}	{32, 46, 16}	{41, 55, 25}	{19, 34, 54}
{31, 53}	{43, 52}	{33, 44}	{48, 28}	{45, 22}	{47, 29}	{24, 49}

{1, 2, 4}	{5, 6, 8}	{9, 10, 12}	{7, 11, 16}	{13, 17, 22}	{14, 18, 23}	{15, 21, 28}
{20, 26, 33}	{24, 32, 50}	{29, 35, 42}	{44, 56, 27}	{48, 3, 31}	{41, 55, 25}	{0, 19, 38}
{40, 45}	{37, 49}	{34, 51}	{36, 52}	{43, 47}	{53, 39}	{30, 54}

{0, 8, 26}	{1, 9, 27}	{2, 12, 35}	{3, 13, 36}	{4, 14, 37}	{6, 17, 38}	{7, 18, 39}
{10, 21, 42}	{11, 23, 51}	{5, 20, 40}	{15, 30, 50}	{32, 46, 16}	{41, 55, 25}	{19, 34, 54}
{53, 22}	{29, 56}	{45, 47}	{28, 49}	{43, 33}	{44, 31}	{24, 52}

$t = 8, u = 65$

{0, 31, 23}	{1, 25, 11}	{2, 20, 13}	{3, 35, 9}	{4, 34, 6}	{5, 24, 27}	{14, 41, 29}
{10, 26, 30}	{15, 47, 32}	{12, 33, 40}	{18, 21, 22}	{19, 42, 50}	{28, 55, 44}	{37, 56, 61}
{16, 45, 36}	{39, 64, 51}	{53, 63}	{7, 48}	{52, 59}	{8, 43}	{17, 49}
{62, 46}	{38, 60}	{54, 57}				

{0, 2, 28}	{1, 15, 33}	{3, 23, 11}	{4, 20, 26}	{6, 27, 31}	{7, 17, 8}	{5, 10, 34}
{9, 22, 39}	{14, 16, 29}	{13, 35, 44}	{18, 48, 21}	{25, 32, 46}	{24, 53, 43}	{36, 62, 37}
{41, 47, 58}	{38, 56, 61}	{49, 54}	{64, 30}	{45, 51}	{63, 50}	{40, 59}
{19, 57}	{12, 52}	{42, 60}				

{0, 31, 23}	{1, 25, 11}	{2, 20, 13}	{3, 35, 9}	{4, 34, 6}	{5, 24, 27}	{14, 41, 29}
{10, 26, 30}	{15, 47, 32}	{12, 33, 40}	{18, 21, 22}	{19, 42, 50}	{28, 55, 44}	{37, 56, 61}
{16, 45, 36}	{39, 64, 51}	{63, 52}	{62, 48}	{49, 57}	{38, 59}	{54, 58}
{43, 60}	{53, 8}	{46, 7}				

{0, 2, 28}	{1, 15, 33}	{3, 23, 11}	{4, 20, 26}	{6, 27, 31}	{7, 17, 8}	{5, 10, 34}
{9, 22, 39}	{14, 16, 29}	{13, 35, 44}	{18, 48, 21}	{25, 32, 46}	{24, 53, 43}	{36, 62, 37}
{41, 47, 58}	{38, 56, 61}	{55, 57}	{42, 19}	{50, 51}	{45, 60}	{49, 12}
{59, 30}	{54, 63}	{40, 52}				

$t = 11, u = 89$

{0, 26, 32}	{1, 19, 42}	{2, 38, 22}	{3, 14, 33}	{4, 39, 35}	{5, 12, 20}	{7, 34, 51}
{6, 45, 37}	{8, 50, 43}	{9, 18, 29}	{16, 40, 41}	{11, 55, 21}	{24, 46, 48}	{17, 31, 59}
{25, 64, 52}	{13, 53, 56}	{36, 72, 49}	{30, 58, 70}	{15, 44, 47}	{23, 61, 28}	{62, 10, 78}
{63, 82, 67}	{68, 84}	{80, 57}	{74, 79}	{71, 86}	{69, 77}	{76, 27}
{85, 66}	{65, 87}	{81, 60}	{83, 73}	{54, 88}		

{0, 1, 25}	{2, 30, 20}	{3, 44, 39}	{4, 13, 34}	{6, 28, 40}	{5, 19, 21}	{9, 29, 42}
{7, 24, 50}	{8, 48, 52}	{12, 41, 49}	{15, 47, 53}	{11, 26, 36}	{16, 54, 45}	{31, 57, 62}
{33, 63, 76}	{43, 46, 65}	{18, 55, 32}	{37, 64, 71}	{69, 70, 22}	{17, 56, 38}	{51, 84, 86}
{60, 77, 66}	{82, 35}	{74, 85}	{73, 23}	{75, 27}	{58, 88}	{79, 72}
{80, 83}	{61, 81}	{67, 14}	{68, 10}	{59, 87}		

{0, 26, 32}	{1, 19, 42}	{2, 38, 22}	{3, 14, 33}	{4, 39, 35}	{5, 12, 20}	{7, 34, 51}
{6, 45, 37}	{8, 50, 43}	{9, 18, 29}	{16, 40, 41}	{11, 55, 21}	{24, 46, 48}	{17, 31, 59}
{25, 64, 52}	{13, 53, 56}	{36, 72, 49}	{30, 58, 70}	{15, 44, 47}	{23, 61, 28}	{62, 10, 78}
{63, 82, 67}	{81, 68}	{76, 77}	{88, 71}	{83, 65}	{66, 80}	{73, 69}
{79, 27}	{57, 86}	{54, 87}	{60, 85}	{84, 75}		

{0, 1, 25}	{2, 30, 20}	{3, 44, 39}	{4, 13, 34}	{6, 28, 40}	{5, 19, 21}	{9, 29, 42}
{7, 24, 50}	{8, 48, 52}	{12, 41, 49}	{15, 47, 53}	{11, 26, 36}	{16, 54, 45}	{31, 57, 62}
{33, 63, 76}	{43, 46, 65}	{18, 55, 32}	{37, 64, 71}	{69, 70, 22}	{17, 56, 38}	{51, 84, 86}
{60, 77, 66}	{58, 82}	{72, 78}	{74, 23}	{59, 85}	{88, 61}	{80, 35}
{75, 87}	{79, 81}	{73, 27}	{67, 10}	{68, 14}		

$t = 12, u = 97$

{27, 28, 75}	{29, 30, 77}	{31, 32, 79}	{10, 25, 45}	{11, 26, 46}	{18, 33, 53}	{0, 8, 39}
{1, 9, 40}	{4, 12, 43}	{34, 50, 74}	{36, 52, 76}	{38, 54, 78}	{7, 16, 35}	{13, 22, 41}
{14, 23, 42}	{37, 48, 66}	{44, 55, 73}	{51, 62, 80}	{56, 69, 86}	{57, 70, 87}	{58, 71, 88}
{5, 15, 49}	{72, 82, 19}	{47, 59, 92}	{61, 64}	{65, 85}	{89, 17}	{90, 96}
{67, 95}	{2, 81}	{93, 3}	{60, 83}	{21, 63}	{24, 68}	{84, 94}
{91, 6}						

{3, 13, 47}	{5, 17, 50}	{6, 18, 51}	{7, 21, 53}	{8, 22, 54}	{9, 23, 55}	{72, 69, 31}
{73, 70, 32}	{74, 71, 33}	{80, 75, 38}	{81, 76, 39}	{82, 77, 40}	{85, 78, 42}	{86, 79, 43}
{91, 84, 48}	{87, 89, 15}	{88, 90, 16}	{92, 94, 20}	{95, 2, 24}	{0, 4, 26}	{56, 62, 83}
{19, 25, 46}	{30, 36, 57}	{37, 41, 63}	{61, 1}	{68, 44}	{67, 96}	{59, 14}
{35, 65}	{66, 34}	{11, 45}	{93, 10}	{12, 52}	{27, 58}	{60, 64}
{28, 49}						

{27, 28, 75}	{29, 30, 77}	{31, 32, 79}	{10, 25, 45}	{11, 26, 46}	{18, 33, 53}	{0, 8, 39}
{1, 9, 40}	{4, 12, 43}	{34, 50, 74}	{36, 52, 76}	{38, 54, 78}	{7, 16, 35}	{13, 22, 41}
{14, 23, 42}	{37, 48, 66}	{44, 55, 73}	{51, 62, 80}	{56, 69, 86}	{57, 70, 87}	{58, 71, 88}
{5, 15, 49}	{72, 82, 19}	{47, 59, 92}	{95, 93}	{20, 3}	{17, 60}	{91, 64}
{68, 6}	{94, 81}	{90, 2}	{67, 83}	{65, 84}	{63, 89}	{96, 21}
{85, 24}						

{3, 13, 47}	{5, 17, 50}	{6, 18, 51}	{7, 21, 53}	{8, 22, 54}	{9, 23, 55}	{72, 69, 31}
{73, 70, 32}	{74, 71, 33}	{80, 75, 38}	{81, 76, 39}	{82, 77, 40}	{85, 78, 42}	{86, 79, 43}
{91, 84, 48}	{87, 89, 15}	{88, 90, 16}	{92, 94, 20}	{95, 2, 24}	{0, 4, 26}	{56, 62, 83}
{19, 25, 46}	{30, 36, 57}	{37, 41, 63}	{68, 27}	{96, 45}	{10, 58}	{52, 60}
{35, 93}	{12, 1}	{61, 66}	{49, 11}	{34, 67}	{44, 59}	{28, 29}
{14, 64}						

$t = 13, u = 105$

{2, 18, 36}	{3, 19, 37}	{4, 20, 38}	{1, 15, 34}	{7, 21, 40}	{8, 22, 41}	{11, 23, 43}
{12, 24, 44}	{13, 25, 45}	{16, 26, 47}	{17, 27, 48}	{29, 39, 60}	{42, 50, 72}	{46, 54, 76}
{49, 57, 79}	{52, 58, 81}	{53, 59, 82}	{55, 61, 84}	{5, 9, 33}	{28, 32, 56}	{62, 66, 90}
{65, 67, 92}	{69, 71, 96}	{73, 75, 100}	{68, 77, 10}	{0, 35, 70}	{97, 31}	{83, 86}
{78, 99}	{30, 101}	{85, 104}	{102, 14}	{51, 91}	{64, 87}	{88, 95}
{80, 93}	{98, 103}	{63, 94}	{74, 6}			

{0, 9, 47}	{1, 10, 48}	{4, 11, 50}	{5, 12, 51}	{6, 13, 52}	{14, 19, 59}	{15, 20, 60}
{16, 21, 61}	{22, 25, 66}	{23, 26, 67}	{24, 27, 68}	{2, 17, 53}	{3, 18, 54}	{28, 43, 79}
{31, 44, 81}	{32, 45, 82}	{33, 46, 83}	{41, 58, 84}	{55, 72, 98}	{56, 73, 99}	{38, 49, 91}
{86, 97, 34}	{89, 100, 37}	{29, 30, 78}	{39, 40, 88}	{63, 64, 7}	{95, 75}	{102, 57}
{36, 85}	{42, 101}	{69, 93}	{62, 77}	{87, 96}	{92, 80}	{74, 104}
{65, 94}	{8, 70}	{76, 35}	{71, 103}			

{2, 18, 36}	{3, 19, 37}	{4, 20, 38}	{1, 15, 34}	{7, 21, 40}	{8, 22, 41}	{11, 23, 43}
{12, 24, 44}	{13, 25, 45}	{16, 26, 47}	{17, 27, 48}	{29, 39, 60}	{42, 50, 72}	{46, 54, 76}
{49, 57, 79}	{52, 58, 81}	{53, 59, 82}	{55, 61, 84}	{5, 9, 33}	{28, 32, 56}	{62, 66, 90}
{65, 67, 92}	{69, 71, 96}	{73, 75, 100}	{68, 77, 10}	{0, 35, 70}	{74, 99}	{6, 63}
{80, 30}	{89, 91}	{104, 93}	{98, 97}	{64, 102}	{103, 85}	{88, 94}
{87, 95}	{86, 14}	{51, 78}	{31, 83}			

{0, 9, 47}	{1, 10, 48}	{4, 11, 50}	{5, 12, 51}	{6, 13, 52}	{14, 19, 59}	{15, 20, 60}
{16, 21, 61}	{22, 25, 66}	{23, 26, 67}	{24, 27, 68}	{2, 17, 53}	{3, 18, 54}	{28, 43, 79}
{31, 44, 81}	{32, 45, 82}	{33, 46, 83}	{41, 58, 84}	{55, 72, 98}	{56, 73, 99}	{38, 49, 91}
{86, 97, 34}	{89, 100, 37}	{29, 30, 78}	{39, 40, 88}	{63, 64, 7}	{101, 57}	{104, 62}
{76, 80}	{65, 87}	{94, 36}	{75, 103}	{77, 8}	{74, 90}	{96, 42}
{95, 69}	{71, 85}	{92, 102}	{35, 70}			

$t = 14, u = 113$

{0, 55, 25}	{2, 56, 19}	{1, 10, 43}	{3, 14, 52}	{6, 57, 7}	{5, 49, 53}	{4, 11, 51}
{9, 45, 15}	{8, 31, 46}	{12, 38, 65}	{16, 32, 18}	{17, 72, 69}	{13, 59, 24}	{22, 73, 54}
{26, 60, 82}	{27, 66, 76}	{21, 39, 63}	{20, 40, 48}	{35, 78, 47}	{34, 84, 77}	{33, 62, 81}
{37, 88, 41}	{30, 85, 86}	{58, 90, 98}	{28, 44, 67}	{29, 83, 70}	{71, 107, 80}	{61, 89, 92}
{99, 36}	{104, 94}	{111, 42}	{93, 106}	{91, 23}	{112, 75}	{105, 64}
{79, 110}	{87, 101}	{109, 74}	{108, 68}	{96, 100}	{97, 50}	{95, 102}

{0, 52, 17}	{1, 45, 12}	{2, 47, 26}	{3, 28, 40}	{4, 19, 24}	{5, 55, 23}	{7, 16, 29}
{13, 50, 30}	{8, 34, 9}	{6, 60, 36}	{14, 59, 63}	{15, 56, 68}	{18, 64, 20}	{10, 58, 48}
{21, 37, 73}	{27, 61, 67}	{25, 81, 39}	{33, 66, 38}	{41, 70, 49}	{31, 57, 62}	{65, 88, 75}
{35, 80, 53}	{42, 83, 44}	{71, 11, 77}	{69, 91, 98}	{72, 106, 87}	{43, 46, 89}	{76, 111, 90}
{82, 22}	{84, 101}	{96, 108}	{110, 85}	{93, 95}	{100, 51}	{112, 78}
{103, 92}	{102, 54}	{86, 104}	{99, 105}	{107, 79}	{94, 32}	{74, 97}

$\{0, 55, 25\}$	$\{2, 56, 19\}$	$\{1, 10, 43\}$	$\{3, 14, 52\}$	$\{6, 57, 7\}$	$\{5, 49, 53\}$	$\{4, 11, 51\}$
$\{9, 45, 15\}$	$\{8, 31, 46\}$	$\{12, 38, 65\}$	$\{16, 32, 18\}$	$\{17, 72, 69\}$	$\{13, 59, 24\}$	$\{22, 73, 54\}$
$\{26, 60, 82\}$	$\{27, 66, 76\}$	$\{21, 39, 63\}$	$\{20, 40, 48\}$	$\{35, 78, 47\}$	$\{34, 84, 77\}$	$\{33, 62, 81\}$
$\{37, 88, 41\}$	$\{30, 85, 86\}$	$\{58, 90, 98\}$	$\{28, 44, 67\}$	$\{29, 83, 70\}$	$\{71, 107, 80\}$	$\{61, 89, 92\}$
$\{110, 74\}$	$\{108, 50\}$	$\{96, 64\}$	$\{101, 102\}$	$\{106, 87\}$	$\{93, 109\}$	$\{100, 105\}$
$\{95, 36\}$	$\{23, 94\}$	$\{99, 42\}$	$\{111, 68\}$	$\{79, 103\}$	$\{112, 91\}$	$\{104, 75\}$

$\{0, 52, 17\}$	$\{1, 45, 12\}$	$\{2, 47, 26\}$	$\{3, 28, 40\}$	$\{4, 19, 24\}$	$\{5, 55, 23\}$	$\{7, 16, 29\}$
$\{13, 50, 30\}$	$\{8, 34, 9\}$	$\{6, 60, 36\}$	$\{14, 59, 63\}$	$\{15, 56, 68\}$	$\{18, 64, 20\}$	$\{10, 58, 48\}$
$\{21, 37, 73\}$	$\{27, 61, 67\}$	$\{25, 81, 39\}$	$\{33, 66, 38\}$	$\{41, 70, 49\}$	$\{31, 57, 62\}$	$\{65, 88, 75\}$
$\{35, 80, 53\}$	$\{42, 83, 44\}$	$\{71, 11, 77\}$	$\{69, 91, 98\}$	$\{72, 106, 87\}$	$\{43, 46, 89\}$	$\{76, 111, 90\}$
$\{105, 78\}$	$\{104, 84\}$	$\{99, 32\}$	$\{103, 51\}$	$\{109, 79\}$	$\{102, 22\}$	$\{86, 94\}$
$\{112, 74\}$	$\{95, 110\}$	$\{92, 101\}$	$\{93, 54\}$	$\{108, 82\}$	$\{85, 107\}$	$\{97, 100\}$

$t = 15, u = 121$

$\{35, 36, 95\}$	$\{37, 38, 97\}$	$\{39, 40, 99\}$	$\{12, 31, 56\}$	$\{13, 32, 57\}$	$\{14, 33, 58\}$	$\{0, 10, 49\}$
$\{1, 11, 50\}$	$\{5, 15, 54\}$	$\{41, 61, 91\}$	$\{42, 62, 92\}$	$\{43, 63, 93\}$	$\{9, 20, 44\}$	$\{16, 27, 51\}$
$\{17, 28, 52\}$	$\{34, 47, 70\}$	$\{46, 59, 82\}$	$\{53, 66, 89\}$	$\{8, 23, 45\}$	$\{64, 79, 101\}$	$\{65, 80, 102\}$
$\{60, 77, 98\}$	$\{67, 84, 105\}$	$\{68, 85, 106\}$	$\{18, 30, 73\}$	$\{69, 81, 3\}$	$\{88, 100, 22\}$	$\{72, 86, 7\}$
$\{90, 104, 25\}$	$\{94, 108, 29\}$	$\{115, 103\}$	$\{96, 21\}$	$\{116, 78\}$	$\{109, 114\}$	$\{83, 117\}$
$\{4, 55\}$	$\{87, 113\}$	$\{75, 107\}$	$\{74, 71\}$	$\{6, 112\}$	$\{26, 76\}$	$\{119, 19\}$
$\{48, 111\}$	$\{24, 118\}$	$\{110, 2\}$				

$\{7, 23, 64\}$	$\{8, 24, 65\}$	$\{9, 25, 66\}$	$\{10, 28, 68\}$	$\{11, 29, 69\}$	$\{12, 30, 70\}$	$\{89, 86, 38\}$
$\{90, 87, 39\}$	$\{91, 88, 40\}$	$\{97, 92, 45\}$	$\{98, 93, 46\}$	$\{99, 94, 47\}$	$\{102, 95, 49\}$	$\{103, 96, 50\}$
$\{107, 100, 54\}$	$\{110, 101, 56\}$	$\{113, 104, 59\}$	$\{114, 105, 60\}$	$\{109, 111, 19\}$	$\{116, 118, 26\}$	$\{117, 119, 27\}$
$\{120, 3, 31\}$	$\{0, 4, 32\}$	$\{73, 79, 106\}$	$\{75, 81, 108\}$	$\{15, 21, 48\}$	$\{33, 41, 67\}$	$\{2, 6, 34\}$
$\{43, 51, 77\}$	$\{44, 52, 78\}$	$\{1, 58\}$	$\{37, 17\}$	$\{20, 63\}$	$\{72, 83\}$	$\{18, 42\}$
$\{14, 80\}$	$\{71, 55\}$	$\{53, 13\}$	$\{112, 16\}$	$\{5, 74\}$	$\{57, 61\}$	$\{82, 22\}$
$\{76, 35\}$	$\{36, 85\}$	$\{115, 62\}$				

$\{35, 36, 95\}$	$\{37, 38, 97\}$	$\{39, 40, 99\}$	$\{12, 31, 56\}$	$\{13, 32, 57\}$	$\{14, 33, 58\}$	$\{0, 10, 49\}$
$\{1, 11, 50\}$	$\{5, 15, 54\}$	$\{41, 61, 91\}$	$\{42, 62, 92\}$	$\{43, 63, 93\}$	$\{9, 20, 44\}$	$\{16, 27, 51\}$
$\{17, 28, 52\}$	$\{34, 47, 70\}$	$\{46, 59, 82\}$	$\{53, 66, 89\}$	$\{8, 23, 45\}$	$\{64, 79, 101\}$	$\{65, 80, 102\}$
$\{60, 77, 98\}$	$\{67, 84, 105\}$	$\{68, 85, 106\}$	$\{18, 30, 73\}$	$\{69, 81, 3\}$	$\{88, 100, 22\}$	$\{72, 86, 7\}$
$\{90, 104, 25\}$	$\{94, 108, 29\}$	$\{6, 4\}$	$\{116, 26\}$	$\{2, 78\}$	$\{103, 110\}$	$\{120, 87\}$
$\{83, 21\}$	$\{75, 117\}$	$\{74, 118\}$	$\{111, 76\}$	$\{114, 115\}$	$\{109, 119\}$	$\{19, 55\}$
$\{96, 48\}$	$\{107, 113\}$	$\{71, 24\}$				

$\{7, 23, 64\}$	$\{8, 24, 65\}$	$\{9, 25, 66\}$	$\{10, 28, 68\}$	$\{11, 29, 69\}$	$\{12, 30, 70\}$	$\{89, 86, 38\}$
$\{90, 87, 39\}$	$\{91, 88, 40\}$	$\{97, 92, 45\}$	$\{98, 93, 46\}$	$\{99, 94, 47\}$	$\{102, 95, 49\}$	$\{103, 96, 50\}$
$\{107, 100, 54\}$	$\{110, 101, 56\}$	$\{113, 104, 59\}$	$\{114, 105, 60\}$	$\{109, 111, 19\}$	$\{116, 118, 26\}$	$\{117, 119, 27\}$
$\{120, 3, 31\}$	$\{0, 4, 32\}$	$\{73, 79, 106\}$	$\{75, 81, 108\}$	$\{15, 21, 48\}$	$\{33, 41, 67\}$	$\{2, 6, 34\}$
$\{43, 51, 77\}$	$\{44, 52, 78\}$	$\{115, 76\}$	$\{42, 14\}$	$\{63, 71\}$	$\{61, 84\}$	$\{5, 22\}$
$\{83, 112\}$	$\{57, 35\}$	$\{80, 13\}$	$\{85, 55\}$	$\{62, 53\}$	$\{1, 20\}$	$\{82, 17\}$
$\{18, 36\}$	$\{58, 72\}$	$\{37, 74\}$				

$t = 16, u = 129$

$\{2, 22, 44\}$	$\{3, 23, 45\}$	$\{4, 24, 46\}$	$\{1, 19, 42\}$	$\{7, 25, 48\}$	$\{8, 26, 49\}$	$\{11, 27, 51\}$
$\{12, 28, 52\}$	$\{13, 29, 53\}$	$\{16, 30, 55\}$	$\{17, 31, 56\}$	$\{18, 32, 57\}$	$\{9, 21, 47\}$	$\{38, 50, 76\}$
$\{54, 66, 92\}$	$\{58, 68, 95\}$	$\{59, 69, 96\}$	$\{60, 70, 97\}$	$\{63, 71, 99\}$	$\{64, 72, 100\}$	$\{65, 73, 101\}$
$\{74, 80, 109\}$	$\{75, 81, 110\}$	$\{77, 83, 112\}$	$\{6, 10, 40\}$	$\{33, 37, 67\}$	$\{84, 88, 118\}$	$\{87, 89, 120\}$
$\{91, 93, 124\}$	$\{111, 113, 15\}$	$\{105, 116, 34\}$	$\{0, 43, 86\}$	$\{85, 94\}$	$\{103, 127\}$	$\{61, 106\}$
$\{117, 36\}$	$\{108, 119\}$	$\{39, 5\}$	$\{20, 78\}$	$\{126, 107\}$	$\{41, 98\}$	$\{115, 14\}$
$\{82, 123\}$	$\{90, 104\}$	$\{79, 114\}$	$\{125, 102\}$	$\{35, 62\}$	$\{121, 122\}$	

$\{0, 11, 58\}$	$\{1, 12, 59\}$	$\{4, 13, 61\}$	$\{5, 14, 62\}$	$\{6, 15, 63\}$	$\{9, 16, 65\}$	$\{10, 17, 66\}$
$\{18, 25, 74\}$	$\{2, 7, 57\}$	$\{21, 26, 76\}$	$\{22, 27, 77\}$	$\{28, 31, 82\}$	$\{29, 32, 83\}$	$\{30, 33, 84\}$
$\{23, 42, 86\}$	$\{24, 43, 87\}$	$\{34, 53, 97\}$	$\{19, 36, 81\}$	$\{37, 54, 99\}$	$\{38, 55, 100\}$	$\{35, 50, 96\}$
$\{41, 56, 102\}$	$\{45, 60, 106\}$	$\{48, 69, 101\}$	$\{51, 72, 104\}$	$\{52, 73, 105\}$	$\{67, 80, 3\}$	$\{103, 116, 39\}$
$\{108, 121, 44\}$	$\{89, 90, 20\}$	$\{109, 110, 40\}$	$\{118, 119, 49\}$	$\{91, 93\}$	$\{68, 124\}$	$\{88, 126\}$
$\{70, 117\}$	$\{123, 71\}$	$\{122, 125\}$	$\{112, 75\}$	$\{113, 92\}$	$\{47, 107\}$	$\{115, 85\}$
$\{95, 64\}$	$\{128, 79\}$	$\{120, 46\}$	$\{78, 111\}$	$\{98, 8\}$	$\{94, 114\}$	

$\{2, 22, 44\}$	$\{3, 23, 45\}$	$\{4, 24, 46\}$	$\{1, 19, 42\}$	$\{7, 25, 48\}$	$\{8, 26, 49\}$	$\{11, 27, 51\}$
$\{12, 28, 52\}$	$\{13, 29, 53\}$	$\{16, 30, 55\}$	$\{17, 31, 56\}$	$\{18, 32, 57\}$	$\{9, 21, 47\}$	$\{38, 50, 76\}$
$\{54, 66, 92\}$	$\{58, 68, 95\}$	$\{59, 69, 96\}$	$\{60, 70, 97\}$	$\{63, 71, 99\}$	$\{64, 72, 100\}$	$\{65, 73, 101\}$
$\{74, 80, 109\}$	$\{75, 81, 110\}$	$\{77, 83, 112\}$	$\{6, 10, 40\}$	$\{33, 37, 67\}$	$\{84, 88, 118\}$	$\{87, 89, 120\}$
$\{91, 93, 124\}$	$\{111, 113, 15\}$	$\{105, 116, 34\}$	$\{0, 43, 86\}$	$\{108, 82\}$	$\{114, 122\}$	$\{41, 102\}$
$\{35, 78\}$	$\{104, 121\}$	$\{125, 79\}$	$\{115, 119\}$	$\{106, 62\}$	$\{94, 123\}$	$\{128, 39\}$
$\{36, 103\}$	$\{90, 14\}$	$\{127, 5\}$	$\{98, 85\}$	$\{126, 61\}$	$\{107, 20\}$	

$\{0, 11, 58\}$	$\{1, 12, 59\}$	$\{4, 13, 61\}$	$\{5, 14, 62\}$	$\{6, 15, 63\}$	$\{9, 16, 65\}$	$\{10, 17, 66\}$
$\{18, 25, 74\}$	$\{2, 7, 57\}$	$\{21, 26, 76\}$	$\{22, 27, 77\}$	$\{28, 31, 82\}$	$\{29, 32, 83\}$	$\{30, 33, 84\}$
$\{23, 42, 86\}$	$\{24, 43, 87\}$	$\{34, 53, 97\}$	$\{19, 36, 81\}$	$\{37, 54, 99\}$	$\{38, 55, 100\}$	$\{35, 50, 96\}$
$\{41, 56, 102\}$	$\{45, 60, 106\}$	$\{48, 69, 101\}$	$\{51, 72, 104\}$	$\{52, 73, 105\}$	$\{67, 80, 3\}$	$\{103, 116, 39\}$
$\{108, 121, 44\}$	$\{89, 90, 20\}$	$\{109, 110, 40\}$	$\{118, 119, 49\}$	$\{92, 124\}$	$\{120, 126\}$	$\{46, 112\}$
$\{95, 117\}$	$\{70, 85\}$	$\{79, 91\}$	$\{78, 8\}$	$\{75, 93\}$	$\{122, 68\}$	$\{47, 98\}$
$\{113, 88\}$	$\{125, 115\}$	$\{71, 107\}$	$\{123, 128\}$	$\{127, 111\}$	$\{64, 114\}$	

A.6 HCURFs of type 8^{21t+1}

An HCURF$_8$ of type 1^{22} with partition $2^9 3^1$ (t=1)

12 :	$\{0,1,3\}$	$\{2,13\}$	$\{4,8\}$	$\{5,9\}$	$\{6,10\}$
	$\{7,11\}$	$\{14,18\}$	$\{15,19\}$	$\{16,20\}$	$\{17,21\}$
2 :	$\{0,1,3\}$	$\{4,9\}$	$\{5,10\}$	$\{6,11\}$	$\{7,8\}$
	$\{12,17\}$	$\{13,18\}$	$\{14,19\}$	$\{15,20\}$	$\{16,21\}$
5 :	$\{0,1,3\}$	$\{2,18\}$	$\{4,20\}$	$\{6,12\}$	$\{7,13\}$
	$\{8,14\}$	$\{9,15\}$	$\{10,16\}$	$\{11,17\}$	$\{19,21\}$
19 :	$\{0,1,3\}$	$\{2,13\}$	$\{4,12\}$	$\{5,20\}$	$\{6,21\}$
	$\{7,14\}$	$\{8,15\}$	$\{9,16\}$	$\{10,17\}$	$\{11,18\}$
4 :	$\{0,1,3\}$	$\{2,5\}$	$\{6,14\}$	$\{7,15\}$	$\{8,16\}$
	$\{9,17\}$	$\{10,18\}$	$\{11,19\}$	$\{12,20\}$	$\{13,21\}$
4 :	$\{0,1,3\}$	$\{2,13\}$	$\{5,14\}$	$\{6,15\}$	$\{7,16\}$
	$\{8,17\}$	$\{9,18\}$	$\{10,19\}$	$\{11,20\}$	$\{12,21\}$
12 :	$\{0,1,3\}$	$\{2,13\}$	$\{4,14\}$	$\{5,15\}$	$\{6,16\}$
	$\{7,17\}$	$\{8,18\}$	$\{9,19\}$	$\{10,20\}$	$\{11,21\}$

An HCURF$_8$ of type 1^{43} with partition $2^{18} 3^2$ (t=2)

24 :	$\{0,1,3\}$	$\{2,6,11\}$	$\{29,39\}$	$\{42,25\}$	$\{38,7\}$
	$\{37,22\}$	$\{10,28\}$	$\{16,36\}$	$\{12,31\}$	$\{19,27\}$
	$\{20,30\}$	$\{33,9\}$	$\{13,34\}$	$\{15,26\}$	$\{40,8\}$
	$\{32,4\}$	$\{14,35\}$	$\{18,23\}$	$\{21,41\}$	$\{5,17\}$
33 :	$\{0,1,3\}$	$\{2,6,11\}$	$\{42,24\}$	$\{41,16\}$	$\{25,38\}$
	$\{10,26\}$	$\{23,35\}$	$\{27,5\}$	$\{37,18\}$	$\{12,20\}$
	$\{31,7\}$	$\{34,8\}$	$\{32,9\}$	$\{14,22\}$	$\{4,21\}$
	$\{29,40\}$	$\{13,28\}$	$\{39,15\}$	$\{17,30\}$	$\{19,36\}$
21 :	$\{0,1,3\}$	$\{2,6,11\}$	$\{15,22\}$	$\{35,37\}$	$\{23,24\}$
	$\{28,41\}$	$\{39,4\}$	$\{9,27\}$	$\{36,5\}$	$\{18,31\}$
	$\{20,40\}$	$\{38,14\}$	$\{7,10\}$	$\{16,33\}$	$\{17,32\}$
	$\{30,42\}$	$\{34,12\}$	$\{19,29\}$	$\{8,25\}$	$\{26,13\}$
31 :	$\{0,1,3\}$	$\{2,6,11\}$	$\{41,7\}$	$\{15,27\}$	$\{12,28\}$
	$\{9,29\}$	$\{24,39\}$	$\{8,21\}$	$\{36,30\}$	$\{25,35\}$
	$\{23,37\}$	$\{14,22\}$	$\{4,16\}$	$\{20,38\}$	$\{10,17\}$
	$\{34,5\}$	$\{42,19\}$	$\{26,40\}$	$\{32,13\}$	$\{18,33\}$
38 :	$\{0,1,3\}$	$\{2,6,11\}$	$\{12,23\}$	$\{27,37\}$	$\{13,19\}$
	$\{10,31\}$	$\{41,14\}$	$\{25,32\}$	$\{4,20\}$	$\{21,35\}$
	$\{42,9\}$	$\{22,16\}$	$\{17,24\}$	$\{40,5\}$	$\{30,36\}$
	$\{28,34\}$	$\{8,29\}$	$\{15,26\}$	$\{39,7\}$	$\{33,18\}$
9 :	$\{0,1,3\}$	$\{2,6,11\}$	$\{40,8\}$	$\{19,27\}$	$\{25,39\}$
	$\{5,15\}$	$\{32,16\}$	$\{17,24\}$	$\{7,20\}$	$\{29,33\}$
	$\{26,10\}$	$\{41,18\}$	$\{34,12\}$	$\{13,23\}$	$\{37,31\}$
	$\{21,35\}$	$\{30,4\}$	$\{42,28\}$	$\{38,14\}$	$\{36,22\}$
18 :	$\{0,1,3\}$	$\{2,6,11\}$	$\{8,33\}$	$\{31,9\}$	$\{17,30\}$
	$\{15,38\}$	$\{20,35\}$	$\{4,10\}$	$\{7,13\}$	$\{29,36\}$
	$\{12,19\}$	$\{14,26\}$	$\{21,37\}$	$\{40,22\}$	$\{27,34\}$
	$\{32,24\}$	$\{25,41\}$	$\{28,39\}$	$\{5,23\}$	$\{42,16\}$

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