

# $O_{10}^-(2).2 \pmod{7}$

|       | blocks | defect | matrix                                  |
|-------|--------|--------|-----------------------------------------|
| $G :$ | 1      | 1      | $7 \times 6$                            |
|       | 2      | 1      | $7 \times 6$                            |
|       | 3      | 0      | $154_1 = \chi_{2,0}, \varphi_{2,0}$     |
|       | 4      | 0      | $154_2 = \chi_{2,1}, \varphi_{2,1}$     |
|       | 5      | 1      | $7 \times 6$                            |
|       | 6      | 1      | $7 \times 6$                            |
|       | 7      | 1      | $7 \times 6$                            |
|       | 8      | 1      | $7 \times 6$                            |
|       | 9      | 0      | $1190_1 = \chi_{5+}, \varphi_{5+}$      |
|       | 10     | 0      | $5236_1 = \chi_{9,0}, \varphi_{9,0}$    |
|       | 11     | 0      | $5236_2 = \chi_{9,1}, \varphi_{9,1}$    |
|       | 12     | 0      | $5236_3 = \chi_{10,0}, \varphi_{10,0}$  |
|       | 13     | 0      | $5236_4 = \chi_{10,1}, \varphi_{10,1}$  |
|       | 14     | 0      | $11900_1 = \chi_{11+}, \varphi_{11+}$   |
|       | 15     | 0      | $6545_1 = \chi_{13,0}, \varphi_{13,0}$  |
|       | 16     | 0      | $6545_2 = \chi_{13,1}, \varphi_{13,1}$  |
|       | 17     | 0      | $6545_3 = \chi_{14,0}, \varphi_{14,0}$  |
|       | 18     | 0      | $6545_4 = \chi_{14,1}, \varphi_{14,1}$  |
|       | 19     | 0      | $7700_1 = \chi_{15,0}, \varphi_{15,0}$  |
|       | 20     | 0      | $7700_2 = \chi_{15,1}, \varphi_{15,1}$  |
|       | 21     | 0      | $13090_1 = \chi_{18,0}, \varphi_{18,0}$ |
|       | 22     | 0      | $13090_2 = \chi_{18,1}, \varphi_{18,1}$ |
|       | 23     | 1      | $7 \times 6$                            |
|       | 24     | 0      | $15708_1 = \chi_{21,0}, \varphi_{21,0}$ |
|       | 25     | 0      | $15708_2 = \chi_{21,1}, \varphi_{21,1}$ |
|       | 26     | 0      | $31416_1 = \chi_{22+}, \varphi_{22+}$   |
|       | 27     | 0      | $22848_1 = \chi_{24,0}, \varphi_{24,0}$ |
|       | 28     | 0      | $22848_2 = \chi_{24,1}, \varphi_{24,1}$ |
|       | 29     | 0      | $52360_1 = \chi_{25+}, \varphi_{25+}$   |
|       | 30     | 0      | $32725_1 = \chi_{27,0}, \varphi_{27,0}$ |
|       | 31     | 0      | $32725_2 = \chi_{27,1}, \varphi_{27,1}$ |
|       | 32     | 0      | $39270_1 = \chi_{29,0}, \varphi_{29,0}$ |
|       | 33     | 0      | $39270_2 = \chi_{29,1}, \varphi_{29,1}$ |
|       | 34     | 0      | $39270_3 = \chi_{30,0}, \varphi_{30,0}$ |
|       | 35     | 0      | $39270_4 = \chi_{30,1}, \varphi_{30,1}$ |
|       | 36     | 0      | $41888_1 = \chi_{31,0}, \varphi_{31,0}$ |
|       | 37     | 0      | $41888_2 = \chi_{31,1}, \varphi_{31,1}$ |
|       | 38     | 0      | $65450_1 = \chi_{34,0}, \varphi_{34,0}$ |
|       | 39     | 0      | $65450_2 = \chi_{34,1}, \varphi_{34,1}$ |
|       | 40     | 0      | $130900_1 = \chi_{35+}, \varphi_{35+}$  |

|  | blocks | defect | matrix                                   |
|--|--------|--------|------------------------------------------|
|  | 41     | 0      | $142800_1 = \chi_{37+}, \varphi_{37+}$   |
|  | 42     | 0      | $78540_1 = \chi_{39,0}, \varphi_{39,0}$  |
|  | 43     | 0      | $78540_2 = \chi_{39,1}, \varphi_{39,1}$  |
|  | 44     | 0      | $83776_1 = \chi_{40,0}, \varphi_{40,0}$  |
|  | 45     | 0      | $83776_2 = \chi_{40,1}, \varphi_{40,1}$  |
|  | 46     | 0      | $209440_1 = \chi_{41+}, \varphi_{41+}$   |
|  | 47     | 0      | $106029_1 = \chi_{43,0}, \varphi_{43,0}$ |
|  | 48     | 0      | $106029_2 = \chi_{43,1}, \varphi_{43,1}$ |
|  | 49     | 0      | $106029_3 = \chi_{44,0}, \varphi_{44,0}$ |
|  | 50     | 0      | $106029_4 = \chi_{44,1}, \varphi_{44,1}$ |
|  | 51     | 0      | $212058_1 = \chi_{45+}, \varphi_{45+}$   |
|  | 52     | 0      | $123200_1 = \chi_{47,0}, \varphi_{47,0}$ |
|  | 53     | 0      | $123200_2 = \chi_{47,1}, \varphi_{47,1}$ |
|  | 54     | 0      | $130900_2 = \chi_{48,0}, \varphi_{48,0}$ |
|  | 55     | 0      | $130900_3 = \chi_{48,1}, \varphi_{48,1}$ |
|  | 56     | 0      | $130900_4 = \chi_{49,0}, \varphi_{49,0}$ |
|  | 57     | 0      | $130900_5 = \chi_{49,1}, \varphi_{49,1}$ |
|  | 58     | 0      | $130900_6 = \chi_{50,0}, \varphi_{50,0}$ |
|  | 59     | 0      | $130900_7 = \chi_{50,1}, \varphi_{50,1}$ |
|  | 60     | 0      | $130900_8 = \chi_{51,0}, \varphi_{51,0}$ |
|  | 61     | 0      | $130900_9 = \chi_{51,1}, \varphi_{51,1}$ |
|  | 62     | 0      | $261800_1 = \chi_{52+}, \varphi_{52+}$   |
|  | 63     | 0      | $157080_1 = \chi_{54,0}, \varphi_{55,0}$ |
|  | 64     | 0      | $157080_2 = \chi_{54,1}, \varphi_{55,1}$ |
|  | 65     | 0      | $157080_3 = \chi_{55,0}, \varphi_{56,0}$ |
|  | 66     | 0      | $157080_4 = \chi_{55,1}, \varphi_{56,1}$ |
|  | 67     | 0      | $380800_1 = \chi_{58+}, \varphi_{59+}$   |
|  | 68     | 0      | $212058_2 = \chi_{61,0}, \varphi_{62,0}$ |
|  | 69     | 0      | $212058_3 = \chi_{61,1}, \varphi_{62,1}$ |
|  | 70     | 0      | $251328_1 = \chi_{63,0}, \varphi_{63,0}$ |
|  | 71     | 0      | $251328_2 = \chi_{63,1}, \varphi_{63,1}$ |
|  | 72     | 0      | $502656_1 = \chi_{64+}, \varphi_{64+}$   |
|  | 73     | 0      | $261800_2 = \chi_{66,0}, \varphi_{66,0}$ |
|  | 74     | 0      | $261800_3 = \chi_{66,1}, \varphi_{66,1}$ |
|  | 75     | 0      | $261800_4 = \chi_{67,0}, \varphi_{67,0}$ |
|  | 76     | 0      | $261800_5 = \chi_{67,1}, \varphi_{67,1}$ |
|  | 77     | 0      | $261800_6 = \chi_{68,0}, \varphi_{68,0}$ |
|  | 78     | 0      | $261800_7 = \chi_{68,1}, \varphi_{68,1}$ |
|  | 79     | 0      | $294525_1 = \chi_{69,0}, \varphi_{70,0}$ |
|  | 80     | 0      | $294525_2 = \chi_{69,1}, \varphi_{70,1}$ |

|  | blocks | defect | matrix                                      |
|--|--------|--------|---------------------------------------------|
|  | 81     | 0      | $294525_3 = \chi_{70,0}, \varphi_{71,0}$    |
|  | 82     | 0      | $294525_4 = \chi_{70,1}, \varphi_{71,1}$    |
|  | 83     | 0      | $589050_1 = \chi_{71+}, \varphi_{72+}$      |
|  | 84     | 0      | $314160_1 = \chi_{74,0}, \varphi_{74,0}$    |
|  | 85     | 0      | $314160_2 = \chi_{74,1}, \varphi_{74,1}$    |
|  | 86     | 0      | $418880_1 = \chi_{76,0}, \varphi_{75,0}$    |
|  | 87     | 0      | $418880_2 = \chi_{76,1}, \varphi_{75,1}$    |
|  | 88     | 0      | $418880_3 = \chi_{77,0}, \varphi_{76,0}$    |
|  | 89     | 0      | $418880_4 = \chi_{77,1}, \varphi_{76,1}$    |
|  | 90     | 0      | $424116_1 = \chi_{78,0}, \varphi_{77,0}$    |
|  | 91     | 0      | $424116_2 = \chi_{78,1}, \varphi_{77,1}$    |
|  | 92     | 0      | $424116_3 = \chi_{79,0}, \varphi_{78,0}$    |
|  | 93     | 0      | $424116_4 = \chi_{79,1}, \varphi_{78,1}$    |
|  | 94     | 0      | $848232_1 = \chi_{80+}, \varphi_{79+}$      |
|  | 95     | 0      | $1047200_1 = \chi_{82+}, \varphi_{82+}$     |
|  | 96     | 0      | $530145_1 = \chi_{84,0}, \varphi_{84,0}$    |
|  | 97     | 0      | $530145_2 = \chi_{84,1}, \varphi_{84,1}$    |
|  | 98     | 0      | $530145_3 = \chi_{85,0}, \varphi_{85,0}$    |
|  | 99     | 0      | $530145_4 = \chi_{85,1}, \varphi_{85,1}$    |
|  | 100    | 0      | $1060290_1 = \chi_{86+}, \varphi_{86+}$     |
|  | 101    | 0      | $1178100_1 = \chi_{88+}, \varphi_{88+}$     |
|  | 102    | 0      | $1178100_2 = \chi_{90+}, \varphi_{90+}$     |
|  | 103    | 0      | $1218560_1 = \chi_{93+}, \varphi_{92+}$     |
|  | 104    | 0      | $630784_1 = \chi_{95,0}, \varphi_{94,0}$    |
|  | 105    | 0      | $630784_2 = \chi_{95,1}, \varphi_{94,1}$    |
|  | 106    | 0      | $1445850_1 = \chi_{98+}, \varphi_{97+}$     |
|  | 107    | 0      | $1445850_2 = \chi_{100+}, \varphi_{99+}$    |
|  | 108    | 0      | $1445850_3 = \chi_{102+}, \varphi_{101+}$   |
|  | 109    | 0      | $837760_1 = \chi_{105,0}, \varphi_{103,0}$  |
|  | 110    | 0      | $837760_2 = \chi_{105,1}, \varphi_{103,1}$  |
|  | 111    | 0      | $848232_2 = \chi_{106,0}, \varphi_{104,0}$  |
|  | 112    | 0      | $848232_3 = \chi_{106,1}, \varphi_{104,1}$  |
|  | 113    | 0      | $1047200_2 = \chi_{109,0}, \varphi_{106,0}$ |
|  | 114    | 0      | $1047200_3 = \chi_{109,1}, \varphi_{106,1}$ |
|  | 115    | 0      | $1060290_2 = \chi_{111,0}, \varphi_{107,0}$ |
|  | 116    | 0      | $1060290_3 = \chi_{111,1}, \varphi_{107,1}$ |
|  | 117    | 0      | $1178100_3 = \chi_{113,0}, \varphi_{108,0}$ |
|  | 118    | 0      | $1178100_4 = \chi_{113,1}, \varphi_{108,1}$ |
|  | 119    | 0      | $1403325_1 = \chi_{114,0}, \varphi_{109,0}$ |
|  | 120    | 0      | $1403325_2 = \chi_{114,1}, \varphi_{109,1}$ |

|  | blocks | defect | matrix                                      |
|--|--------|--------|---------------------------------------------|
|  | 121    | 0      | $1403325_3 = \chi_{115,0}, \varphi_{110,0}$ |
|  | 122    | 0      | $1403325_4 = \chi_{115,1}, \varphi_{110,1}$ |

| Block 1:                 | $\varphi_{1,0}$ | $\varphi_{7,0}$ | $\varphi_{19,0}$ | $\varphi_{28,0}$ | $\varphi_{54,0}$ | $\varphi_{61,0}$ |                             |
|--------------------------|-----------------|-----------------|------------------|------------------|------------------|------------------|-----------------------------|
| $1_1 = \chi_{1,0}$       | 1               | .               | .                | .                | .                | .                | $\varphi_{1,0} = 1_1$       |
| $748_1 = \chi_{7,0}$     | 1               | 1               | .                | .                | .                | .                | $\varphi_{7,0} = 747_1$     |
| $14960_1 = \chi_{19,0}$  | .               | .               | 1                | .                | .                | .                | $\varphi_{19,0} = 14960_1$  |
| $35904_1 = \chi_{28,0}$  | .               | 1               | .                | 1                | .                | .                | $\varphi_{28,0} = 35157_1$  |
| $171072_1 = \chi_{56,0}$ | .               | .               | 1                | .                | 1                | .                | $\varphi_{54,0} = 156112_1$ |
| $227205_1 = \chi_{62,0}$ | .               | .               | .                | 1                | .                | 1                | $\varphi_{61,0} = 192048_1$ |
| $348160_1 = \chi_{75,0}$ | .               | .               | .                | .                | 1                | 1                |                             |

| Block 2:                 | $\varphi_{1,1}$ | $\varphi_{7,1}$ | $\varphi_{19,1}$ | $\varphi_{28,1}$ | $\varphi_{54,1}$ | $\varphi_{61,1}$ |                             |
|--------------------------|-----------------|-----------------|------------------|------------------|------------------|------------------|-----------------------------|
| $1_2 = \chi_{1,1}$       | 1               | .               | .                | .                | .                | .                | $\varphi_{1,1} = 1_2$       |
| $748_2 = \chi_{7,1}$     | 1               | 1               | .                | .                | .                | .                | $\varphi_{7,1} = 747_2$     |
| $14960_2 = \chi_{19,1}$  | .               | .               | 1                | .                | .                | .                | $\varphi_{19,1} = 14960_2$  |
| $35904_2 = \chi_{28,1}$  | .               | 1               | .                | 1                | .                | .                | $\varphi_{28,1} = 35157_2$  |
| $171072_2 = \chi_{56,1}$ | .               | .               | 1                | .                | 1                | .                | $\varphi_{54,1} = 156112_2$ |
| $227205_2 = \chi_{62,1}$ | .               | .               | .                | 1                | .                | 1                | $\varphi_{61,1} = 192048_2$ |
| $348160_2 = \chi_{75,1}$ | .               | .               | .                | .                | 1                | 1                |                             |

| Block 5:                   | $\varphi_{3,0}$ | $\varphi_{16,1}$ | $\varphi_{33,0}$ | $\varphi_{57,1}$ | $\varphi_{81,1}$ | $\varphi_{96,0}$ |                             |
|----------------------------|-----------------|------------------|------------------|------------------|------------------|------------------|-----------------------------|
| $187_1 = \chi_{3,0}$       | 1               | .                | .                | .                | .                | .                | $\varphi_{3,0} = 187_1$     |
| $9350_2 = \chi_{16,1}$     | .               | 1                | .                | .                | .                | .                | $\varphi_{16,1} = 9350_2$   |
| $56100_1 = \chi_{32,0}$    | 1               | .                | 1                | .                | .                | .                | $\varphi_{33,0} = 55913_1$  |
| $181764_2 = \chi_{57,1}$   | .               | 1                | .                | 1                | .                | .                | $\varphi_{57,1} = 172414_2$ |
| $598400_2 = \chi_{92,1}$   | .               | .                | .                | 1                | 1                | .                | $\varphi_{81,1} = 425986_2$ |
| $765952_1 = \chi_{104,0}$  | .               | .                | 1                | .                | .                | 1                | $\varphi_{96,0} = 710039_1$ |
| $1136025_1 = \chi_{112,0}$ | .               | .                | .                | .                | 1                | 1                |                             |

| <b>Block 6:</b>            | $\varphi_{3,1}$ | $\varphi_{16,0}$ | $\varphi_{33,1}$ | $\varphi_{57,0}$ | $\varphi_{81,0}$ | $\varphi_{96,1}$ |                             |
|----------------------------|-----------------|------------------|------------------|------------------|------------------|------------------|-----------------------------|
| $187_2 = \chi_{3,1}$       | 1               | .                | .                | .                | .                | .                | $\varphi_{3,1} = 187_2$     |
| $9350_1 = \chi_{16,0}$     | .               | 1                | .                | .                | .                | .                | $\varphi_{16,0} = 9350_1$   |
| $56100_2 = \chi_{32,1}$    | 1               | .                | 1                | .                | .                | .                | $\varphi_{33,1} = 55913_2$  |
| $181764_1 = \chi_{57,0}$   | .               | 1                | .                | 1                | .                | .                | $\varphi_{57,0} = 172414_1$ |
| $598400_1 = \chi_{92,0}$   | .               | .                | .                | 1                | 1                | .                | $\varphi_{81,0} = 425986_1$ |
| $765952_2 = \chi_{104,1}$  | .               | .                | 1                | .                | .                | 1                | $\varphi_{96,1} = 710039_2$ |
| $1136025_2 = \chi_{112,1}$ | .               | .                | .                | .                | 1                | 1                |                             |

| <b>Block 7:</b>            | $\varphi_{4,0}$ | $\varphi_{8,1}$ | $\varphi_{17,0}$ | $\varphi_{32,0}$ | $\varphi_{58,0}$ | $\varphi_{105,0}$ |                              |
|----------------------------|-----------------|-----------------|------------------|------------------|------------------|-------------------|------------------------------|
| $340_1 = \chi_{4,0}$       | 1               | .               | .                | .                | .                | .                 | $\varphi_{4,0} = 340_1$      |
| $2244_2 = \chi_{8,1}$      | .               | 1               | .                | .                | .                | .                 | $\varphi_{8,1} = 2244_2$     |
| $10692_1 = \chi_{17,0}$    | 1               | .               | 1                | .                | .                | .                 | $\varphi_{17,0} = 10352_1$   |
| $59840_1 = \chi_{33,0}$    | .               | .               | 1                | 1                | .                | .                 | $\varphi_{32,0} = 49488_1$   |
| $191488_1 = \chi_{60,0}$   | .               | 1               | .                | .                | 1                | .                 | $\varphi_{58,0} = 189244_1$  |
| $908820_1 = \chi_{107,0}$  | .               | .               | .                | 1                | .                | 1                 | $\varphi_{105,0} = 859332_1$ |
| $1048576_1 = \chi_{110,0}$ | .               | .               | .                | .                | 1                | 1                 |                              |

| <b>Block 8:</b>            | $\varphi_{4,1}$ | $\varphi_{8,0}$ | $\varphi_{17,1}$ | $\varphi_{32,1}$ | $\varphi_{58,1}$ | $\varphi_{105,1}$ |                              |
|----------------------------|-----------------|-----------------|------------------|------------------|------------------|-------------------|------------------------------|
| $340_2 = \chi_{4,1}$       | 1               | .               | .                | .                | .                | .                 | $\varphi_{4,1} = 340_2$      |
| $2244_1 = \chi_{8,0}$      | .               | 1               | .                | .                | .                | .                 | $\varphi_{8,0} = 2244_1$     |
| $10692_2 = \chi_{17,1}$    | 1               | .               | 1                | .                | .                | .                 | $\varphi_{17,1} = 10352_2$   |
| $59840_2 = \chi_{33,1}$    | .               | .               | 1                | 1                | .                | .                 | $\varphi_{32,1} = 49488_2$   |
| $191488_2 = \chi_{60,1}$   | .               | 1               | .                | .                | 1                | .                 | $\varphi_{58,1} = 189244_2$  |
| $908820_2 = \chi_{107,1}$  | .               | .               | .                | 1                | .                | 1                 | $\varphi_{105,1} = 859332_2$ |
| $1048576_2 = \chi_{110,1}$ | .               | .               | .                | .                | 1                | 1                 |                              |

| <b>Block 23:</b>          | $\varphi_{20,0}$ | $\varphi_{20,1}$ | $\varphi_{69,0}$ | $\varphi_{69,1}$ | $\varphi_{95,0}$ | $\varphi_{95,1}$ |                             |
|---------------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------------------------|
| $15147_1 = \chi_{20,0}$   | 1                | .                | .                | .                | .                | .                | $\varphi_{20,0} = 15147_1$  |
| $15147_2 = \chi_{20,1}$   | .                | 1                | .                | .                | .                | .                | $\varphi_{20,1} = 15147_2$  |
| $302940_1 = \chi_{73,0}$  | 1                | .                | 1                | .                | .                | .                | $\varphi_{69,0} = 287793_1$ |
| $302940_2 = \chi_{73,1}$  | .                | 1                | .                | 1                | .                | .                | $\varphi_{69,1} = 287793_2$ |
| $1363230_1 = \chi_{96+}$  | .                | .                | .                | .                | 1                | 1                | $\varphi_{95,0} = 681615_1$ |
| $969408_1 = \chi_{108,0}$ | .                | .                | 1                | .                | 1                | .                | $\varphi_{95,1} = 681615_2$ |
| $969408_2 = \chi_{108,1}$ | .                | .                | .                | 1                | .                | 1                |                             |