

Implementacija reverzibilnega MUX s QCA

Anže Arhar

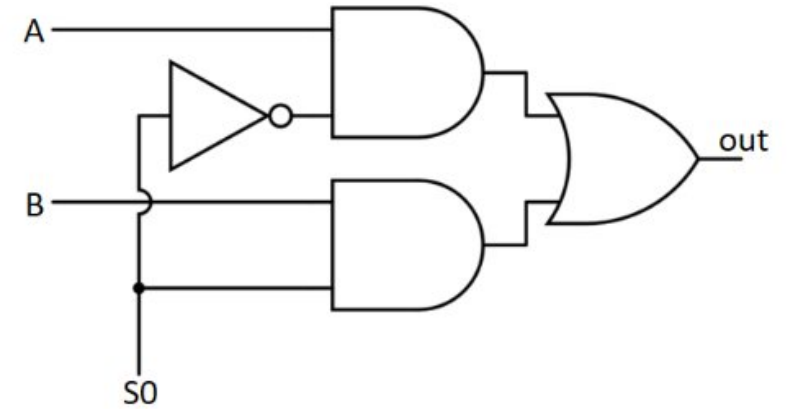
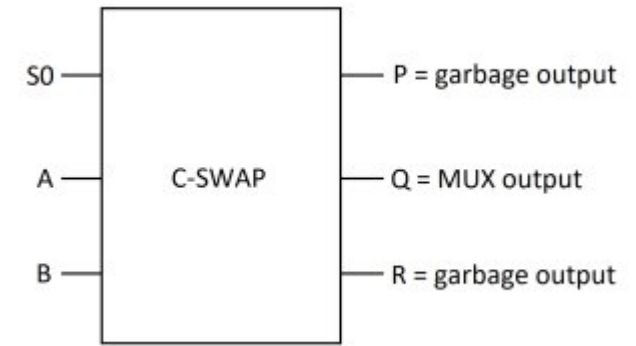
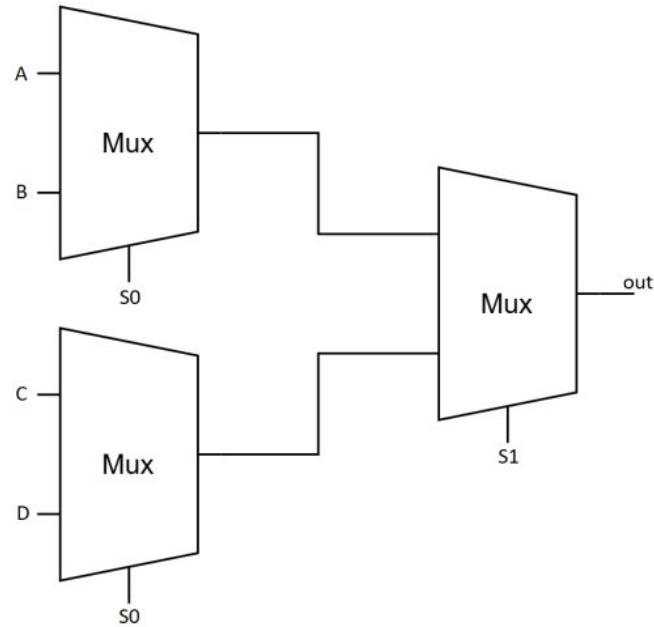
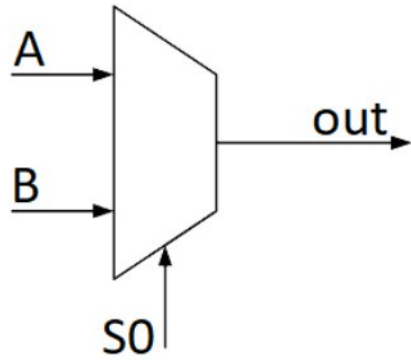
Kristjan Kostanjšek

Nejc Ločičnik

Fredkinova funkcija

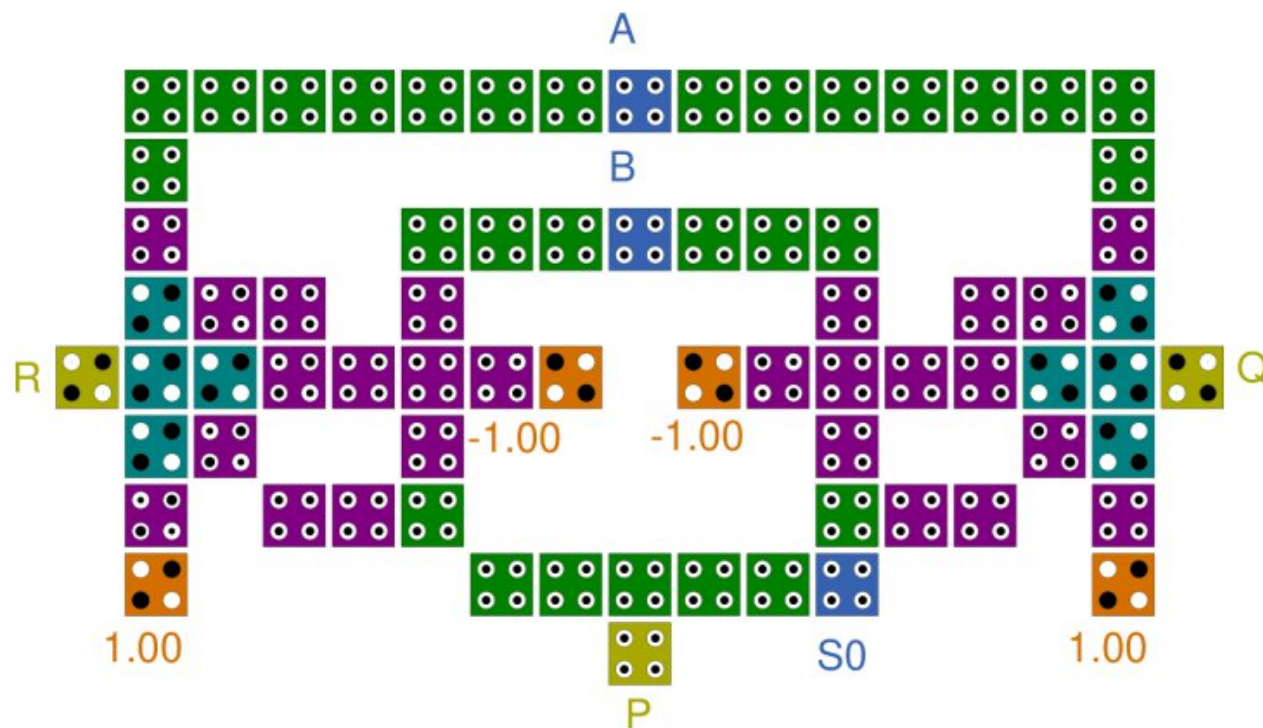
<i>A</i>	<i>B</i>	<i>C</i>	<i>P</i>	<i>Q</i>	<i>R</i>
0	0	0	0	0	0
0	0	1	0	0	1
0	1	0	0	1	0
0	1	1	0	1	1
1	0	0	1	0	0
1	0	1	1	1	0
1	1	0	1	0	1
1	1	1	1	1	1

Multiplexer



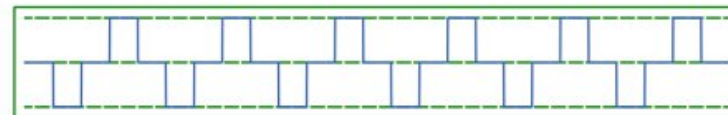
Realizacija reverzibilnega 2:1
multiplekserja s QCA

Prva implementacija

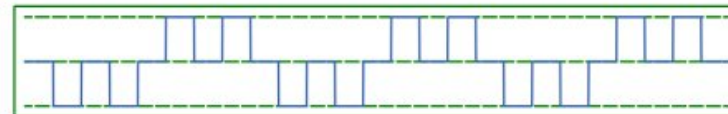


Simulation Results

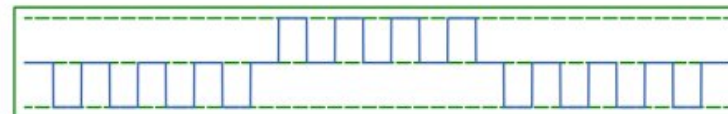
max: 1.00e+000
S0
min: -1.00e+000



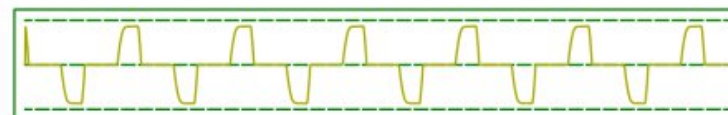
max: 1.00e+000
A
min: -1.00e+000



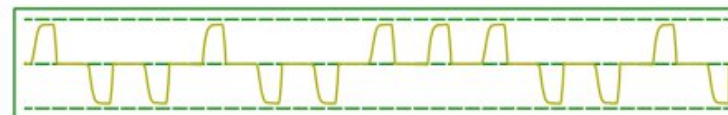
max: 1.00e+000
B
min: -1.00e+000



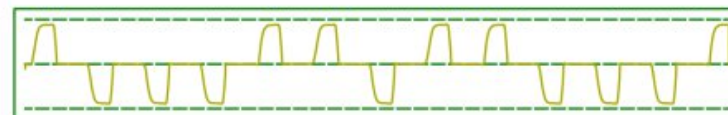
max: 8.66e-001
P
min: -8.66e-001



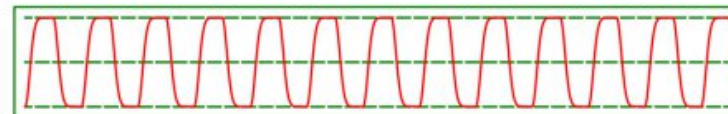
max: 8.85e-001
Q
min: -8.87e-001



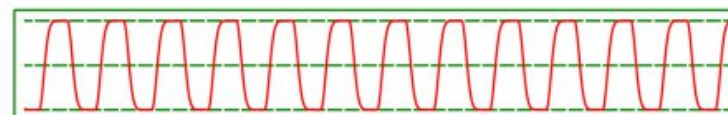
max: 8.85e-001
R
min: -8.87e-001



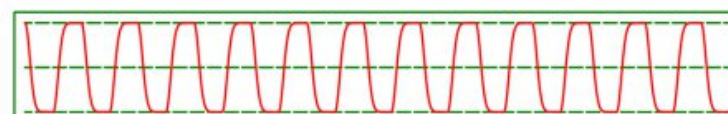
max: 9.80e-022
CLOCK 0
min: 3.80e-023



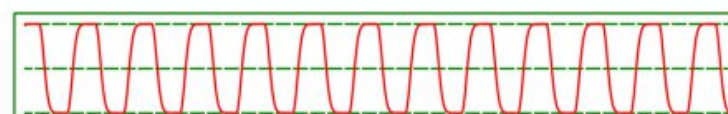
max: 9.80e-022
CLOCK 1
min: 3.80e-023



max: 9.80e-022
CLOCK 2
min: 3.80e-023

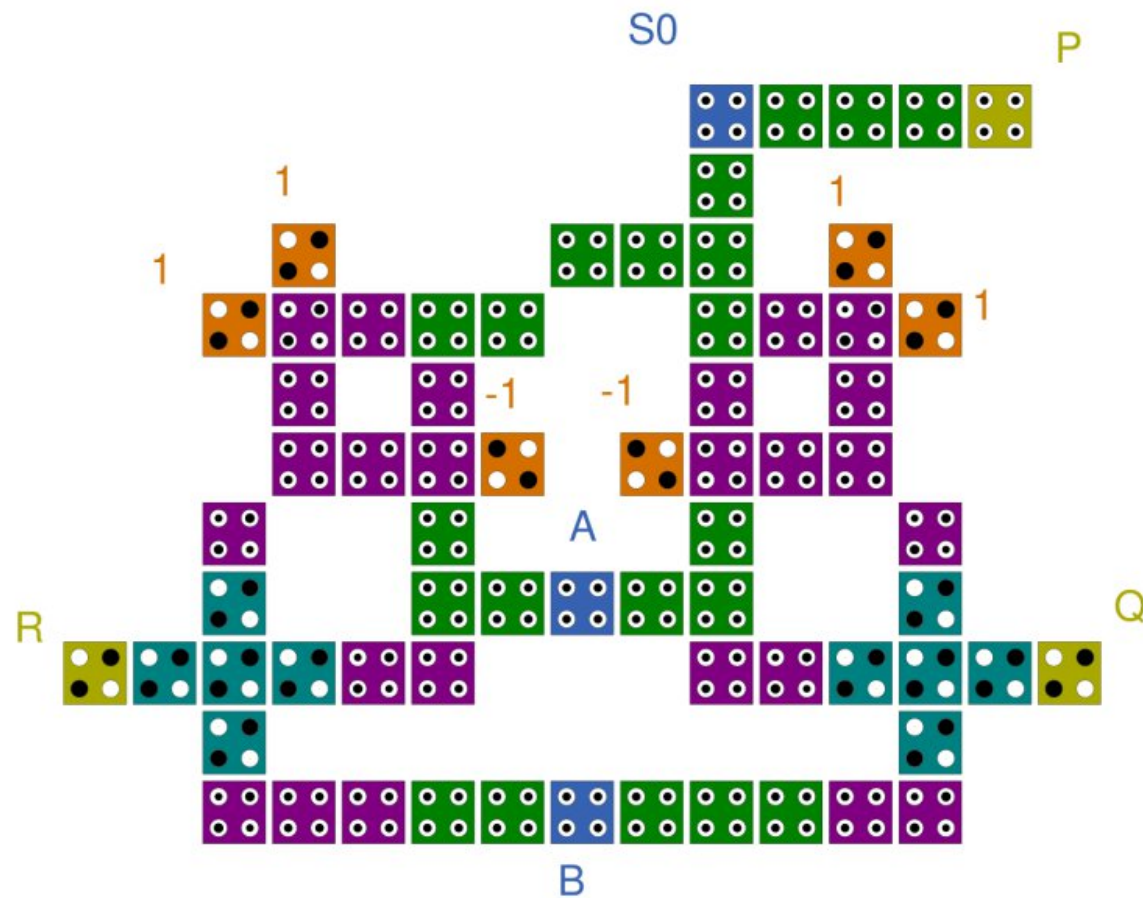


max: 9.80e-022
CLOCK 3
min: 3.80e-023



0 500 1000 1500 2000 2500

Druga implementacija



Simulation Results

max: 1.00e+000
B
min: -1.00e+000

max: 1.00e+000
A
min: -1.00e+000

max: 1.00e+000
S0
min: -1.00e+000

max: 9.52e-001
R
min: -9.52e-001

max: 9.52e-001
Q
min: -9.52e-001

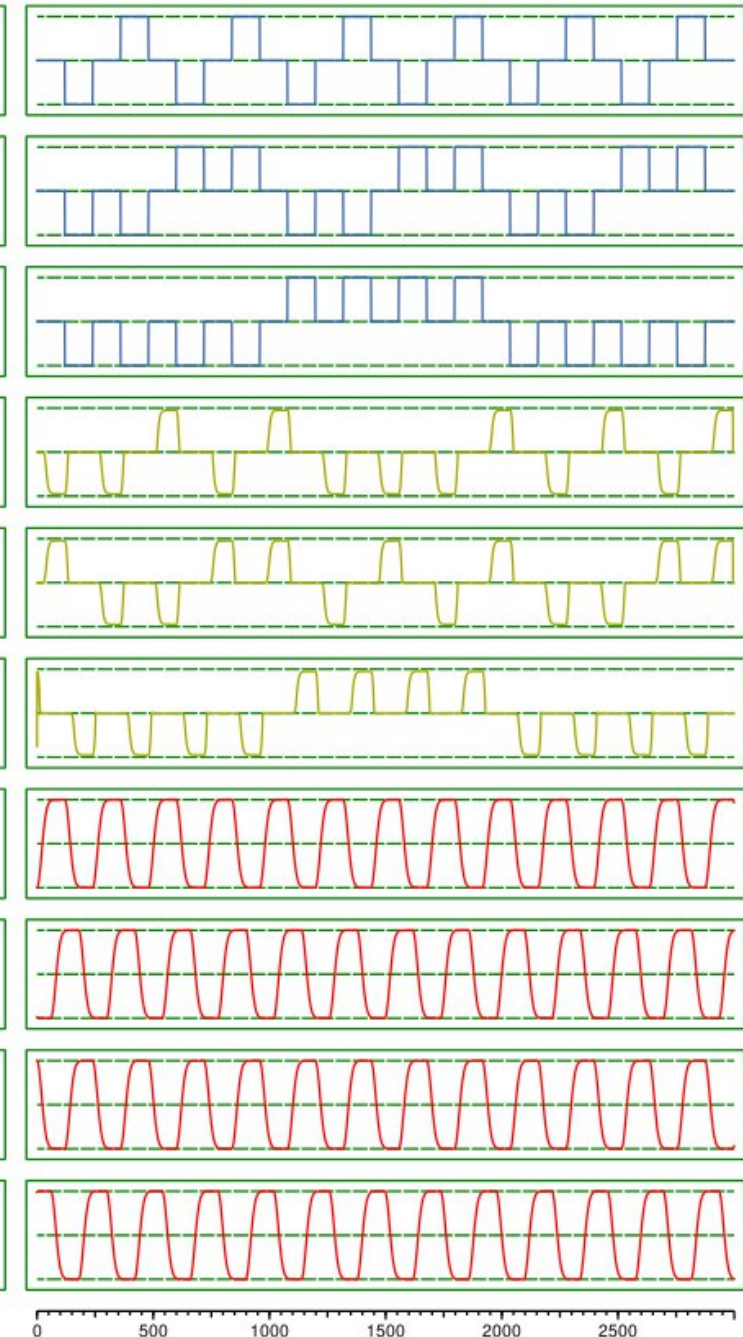
max: 9.54e-001
P
min: -9.55e-001

max: 9.80e-022
CLOCK 0
min: 3.80e-023

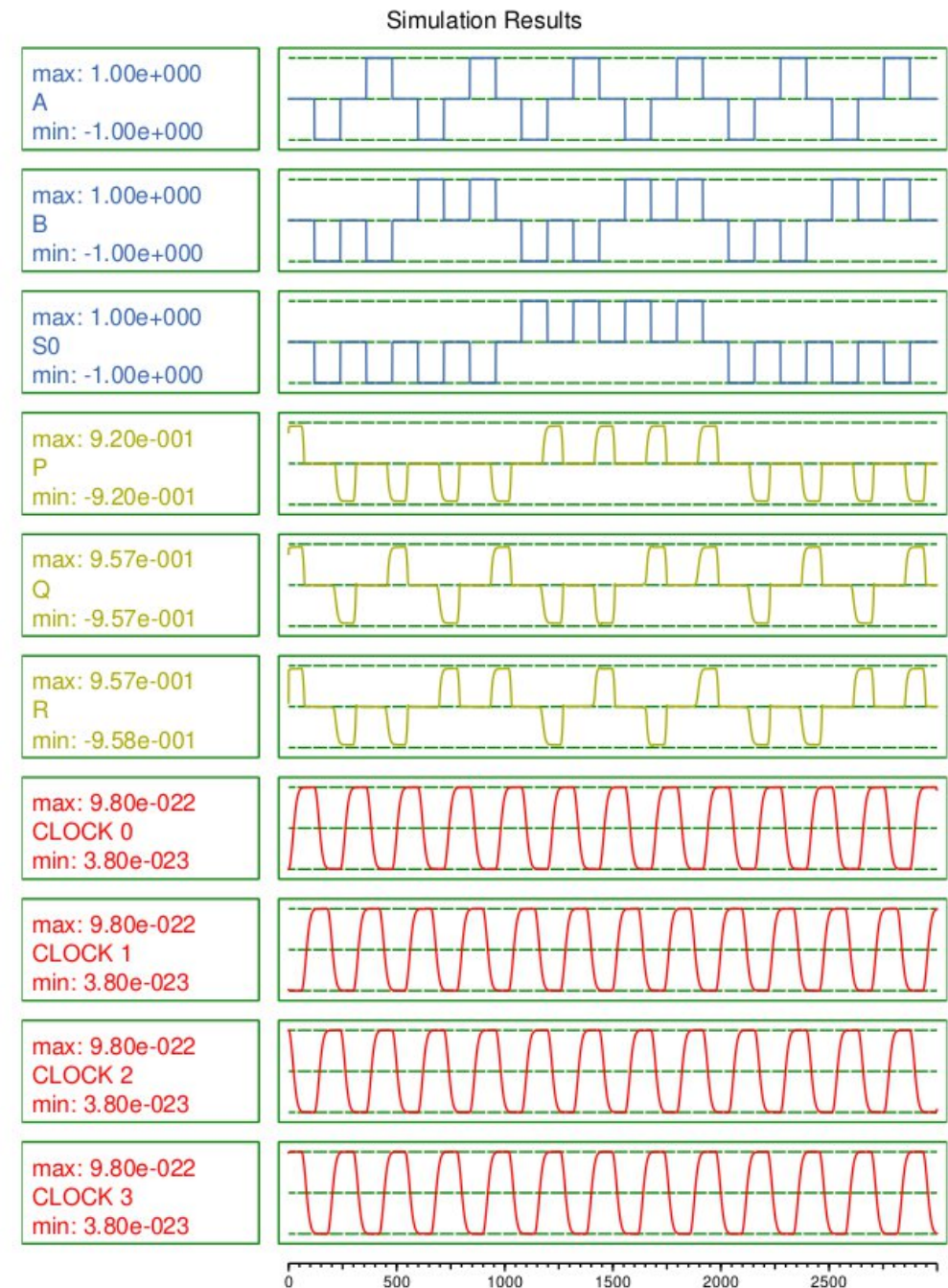
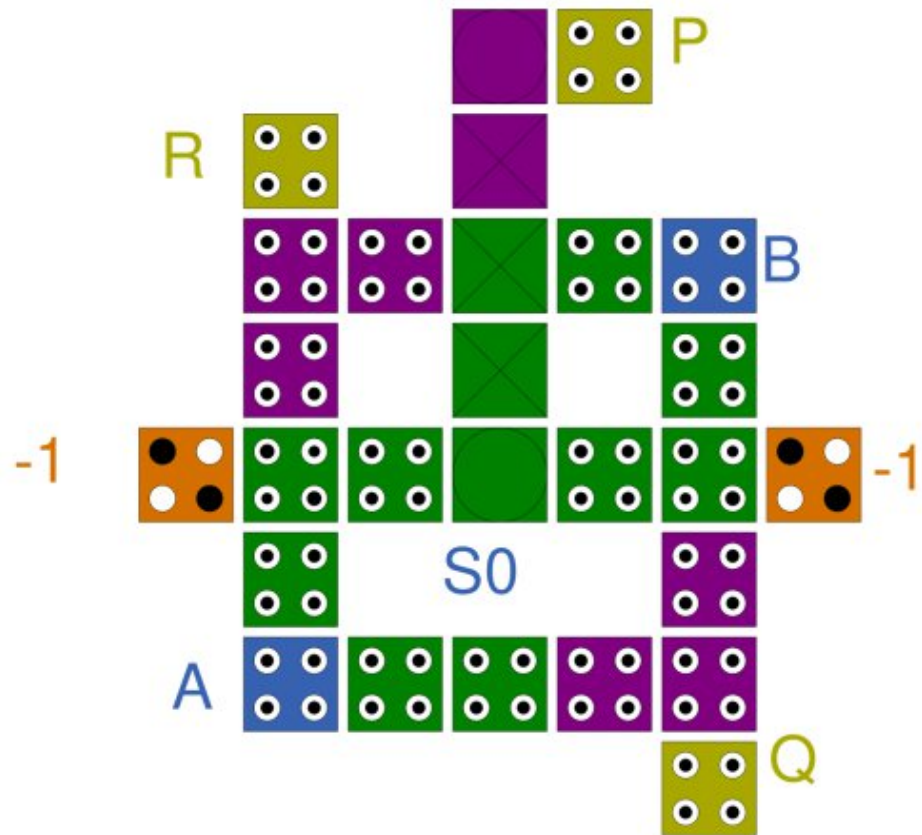
max: 9.80e-022
CLOCK 1
min: 3.80e-023

max: 9.80e-022
CLOCK 2
min: 3.80e-023

max: 9.80e-022
CLOCK 3
min: 3.80e-023

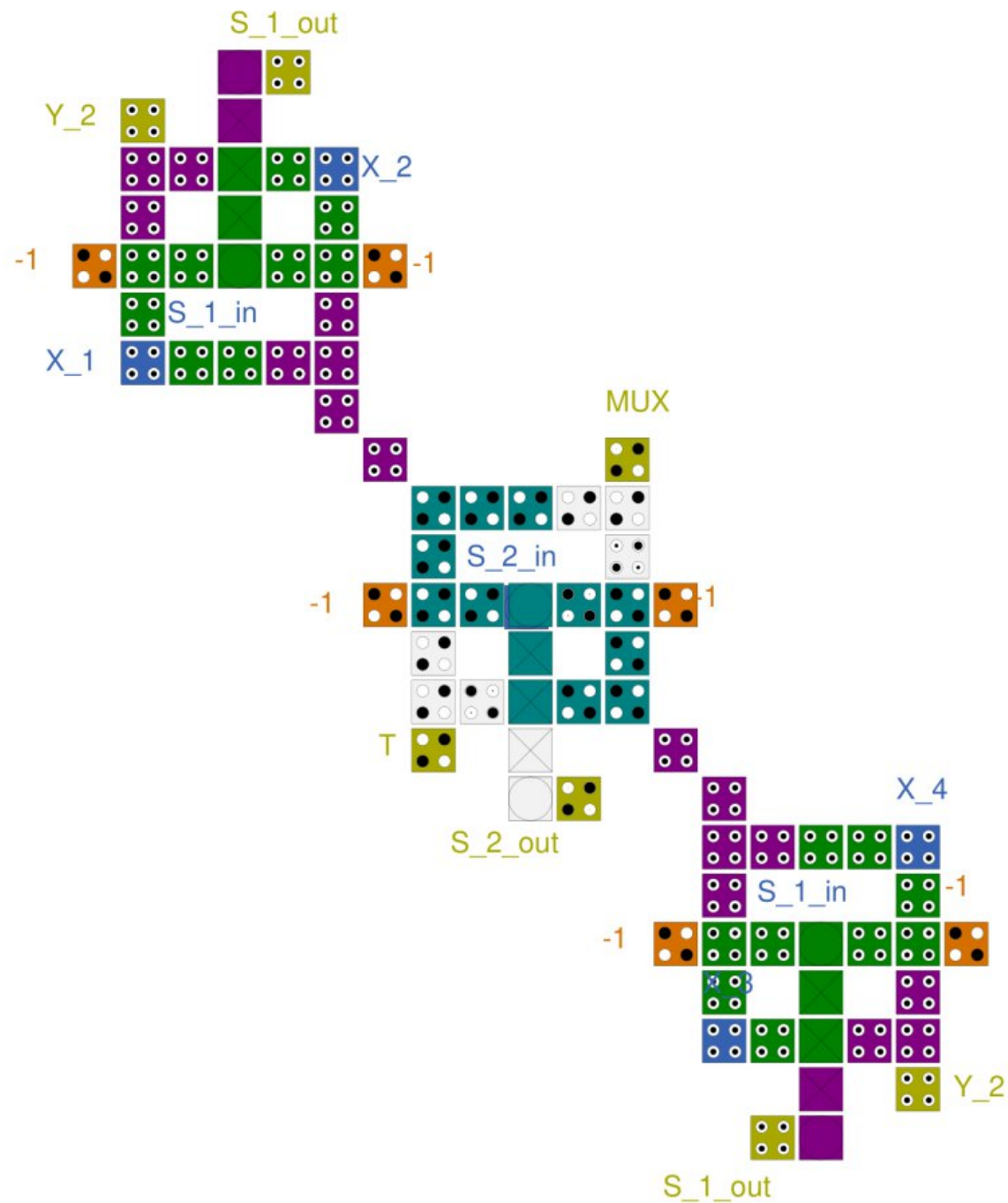


Tretja implementacija



Realizacija reverzibilnega 4:1
multiplekserja s QCA

Implementacija



Rezultati

Vir	MUX	Število celic	Površina [μm^2]	Razpšritev energije [eV]	Število urinih ciklov	Deluje
12	2:1	73	0.08 μm^2	2,91e-002 eV	3	Da
13	2:1	68	0.09 μm^2	2,71e-002 eV	3	Ne
14	2:1	30	0.03 μm^2	2.50e-002 eV	2	Da
/	4:1	92	0.21 μm^2	5.00e-002 eV	4	Ne