

Implementacija reverzibilnega MUX s QCA

Anže Arhar

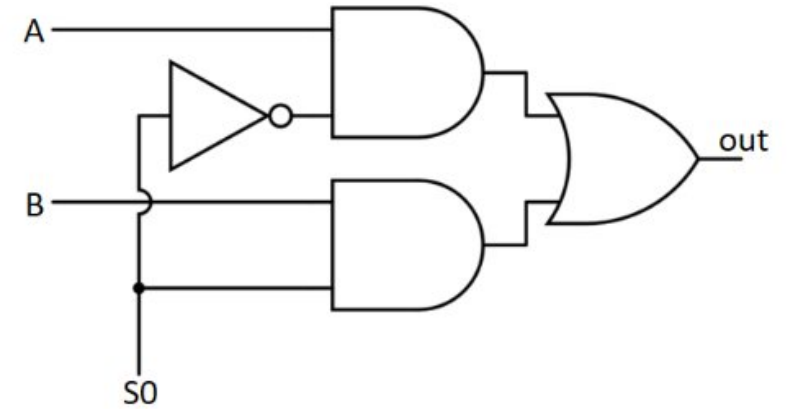
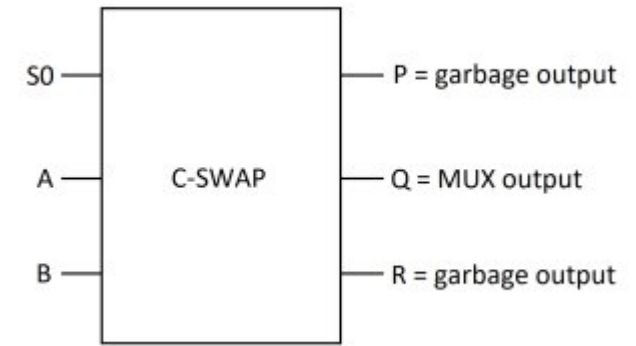
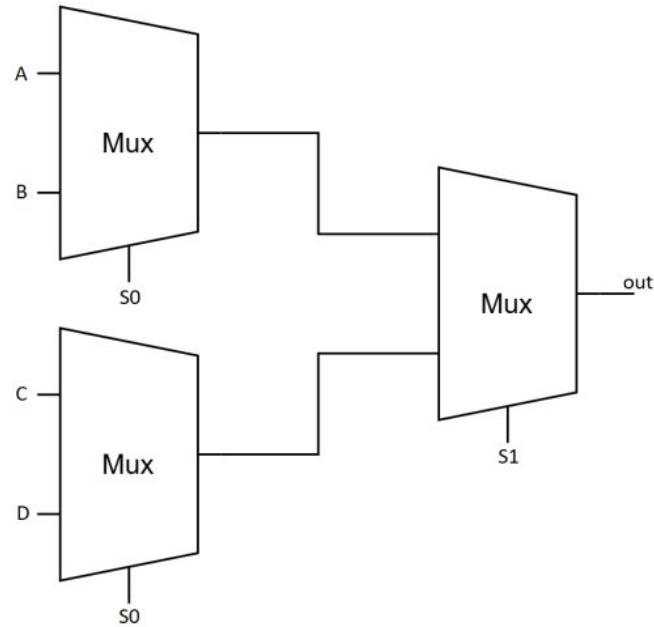
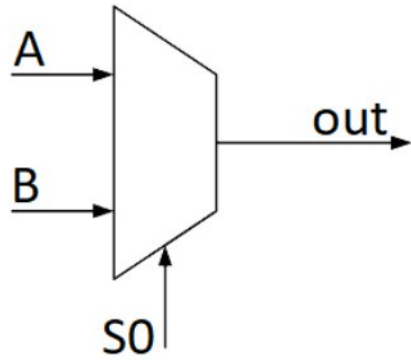
Kristjan Kostanjšek

Nejc Ločičnik

Fredkinova funkcija

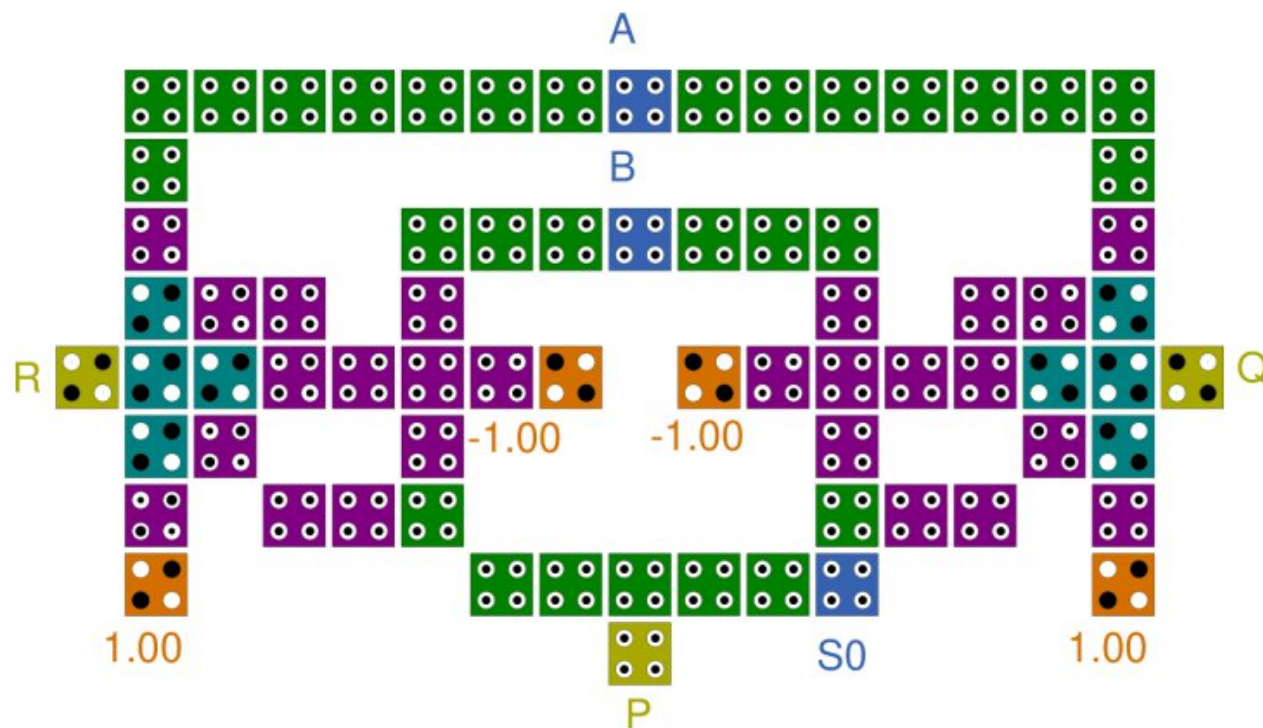
| <i>A</i> | <i>B</i> | <i>C</i> | <i>P</i> | <i>Q</i> | <i>R</i> |
|----------|----------|----------|----------|----------|----------|
| 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 1 |
| 0 | 1 | 0 | 0 | 1 | 0 |
| 0 | 1 | 1 | 0 | 1 | 1 |
| 1 | 0 | 0 | 1 | 0 | 0 |
| 1 | 0 | 1 | 1 | 1 | 0 |
| 1 | 1 |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

Multiplexer



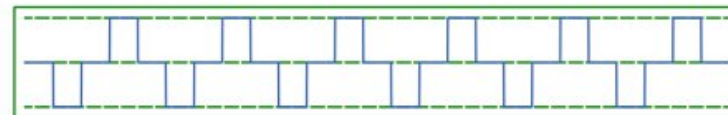
Realizacija reverzibilnega 2:1
multiplekserja s QCA

Prva implementacija

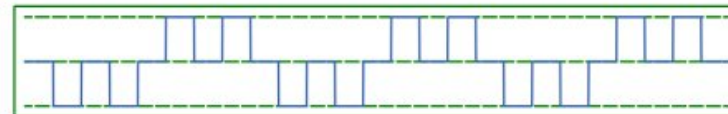


Simulation Results

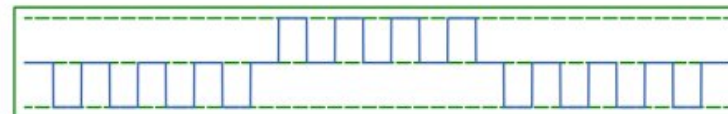
max: 1.00e+000
S0
min: -1.00e+000



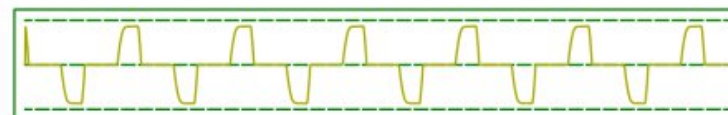
max: 1.00e+000
A
min: -1.00e+000



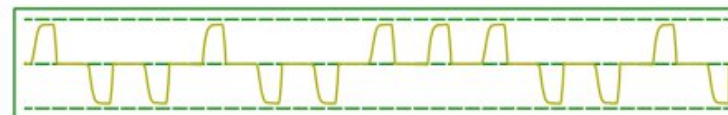
max: 1.00e+000
B
min: -1.00e+000



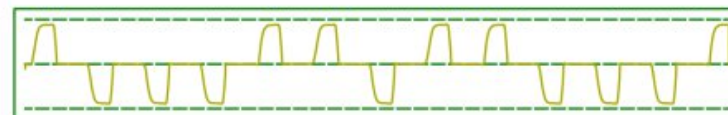
max: 8.66e-001
P
min: -8.66e-001



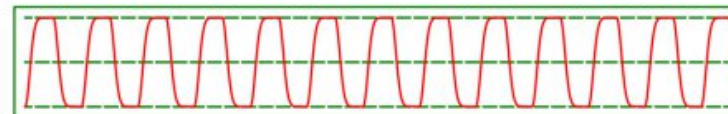
max: 8.85e-001
Q
min: -8.87e-001



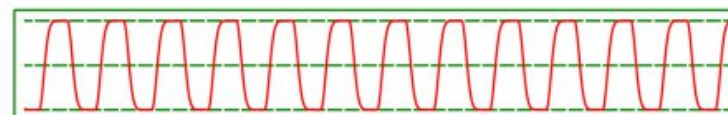
max: 8.85e-001
R
min: -8.87e-001



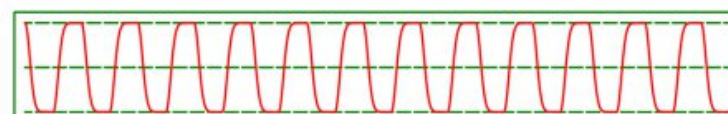
max: 9.80e-022
CLOCK 0
min: 3.80e-023



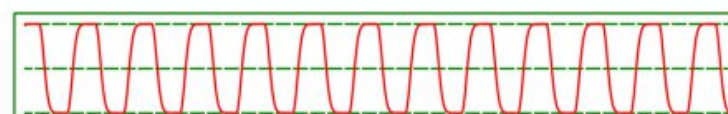
max: 9.80e-022
CLOCK 1
min: 3.80e-023



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

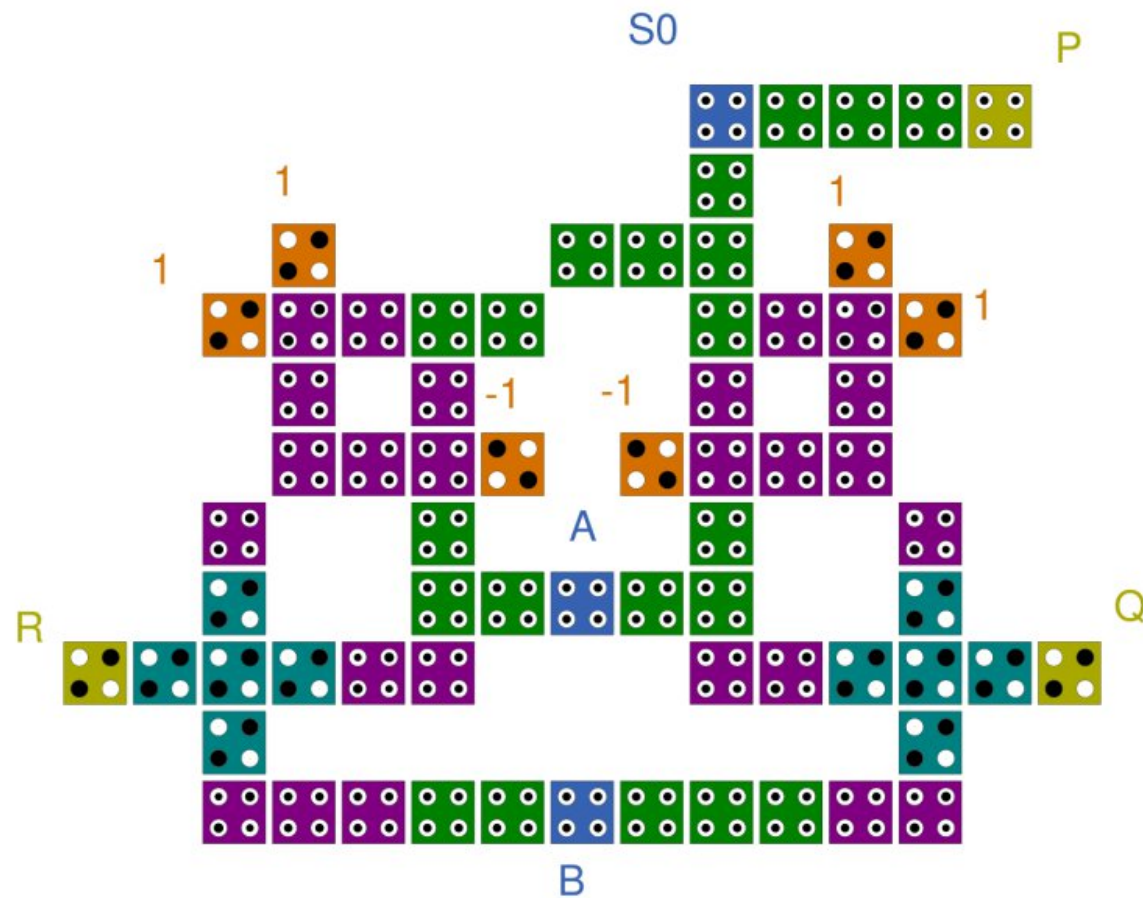


max: 9.80e-022
CLOCK 3
min: 3.80e-023



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

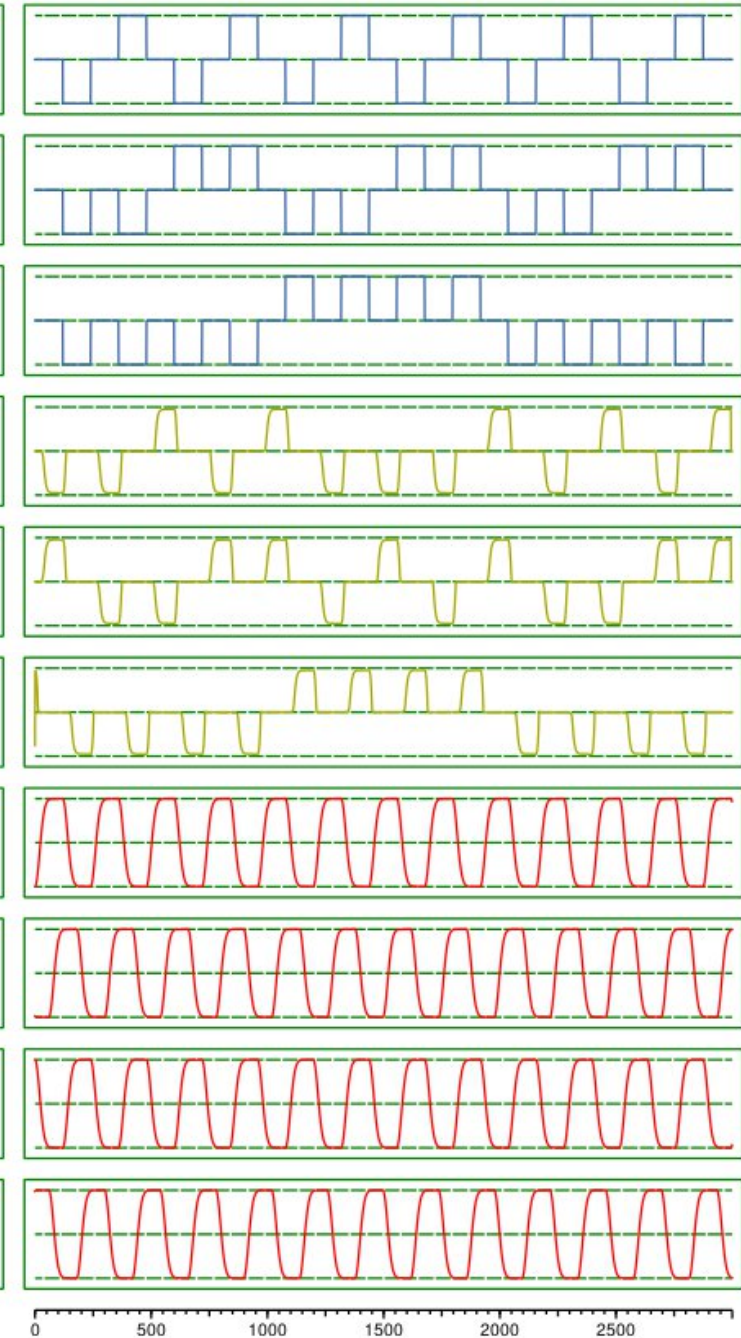
max: 9.54e-001
P
min: -9.55e-001

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

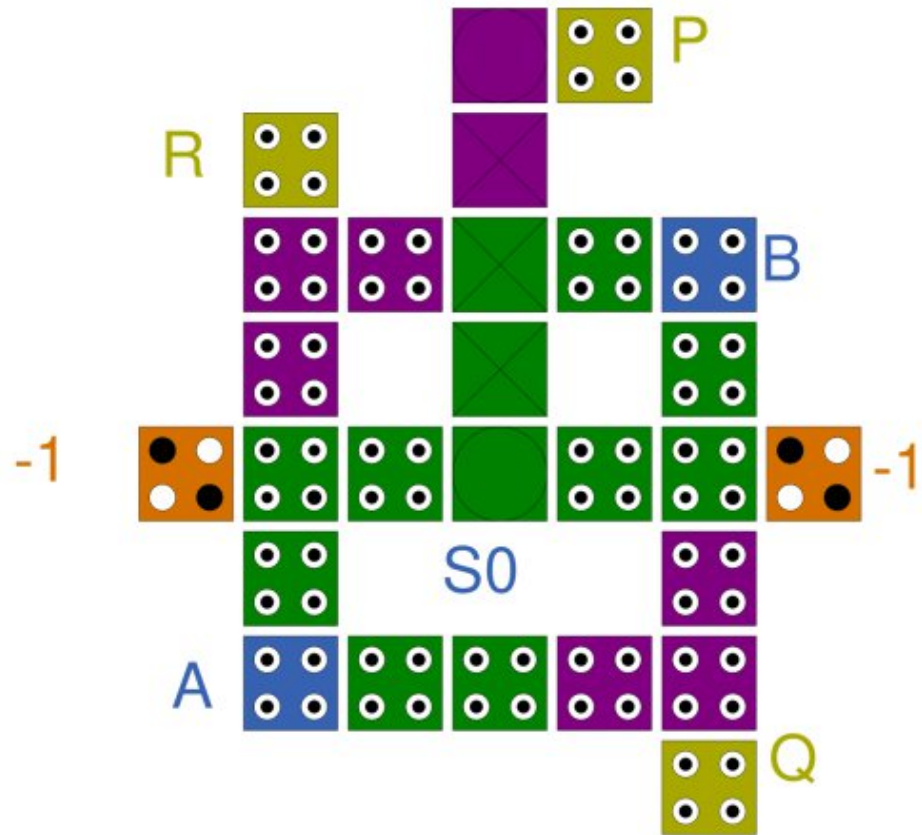
max: 9.80e-022
CLOCK 1
min: 3.80e-023

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

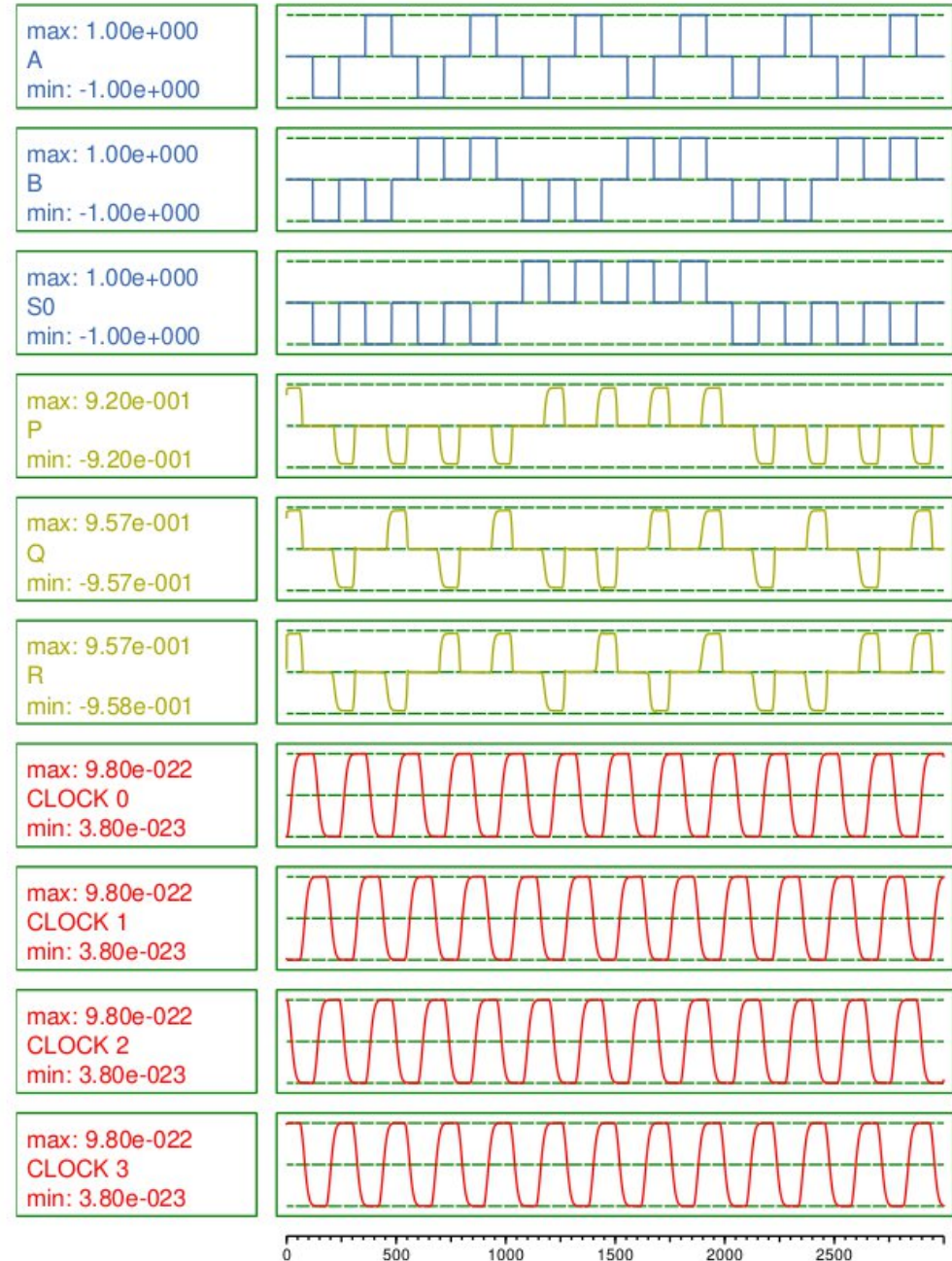
max: 9.80e-022
CLOCK 3
min: 3.80e-023



Tretja implementacija

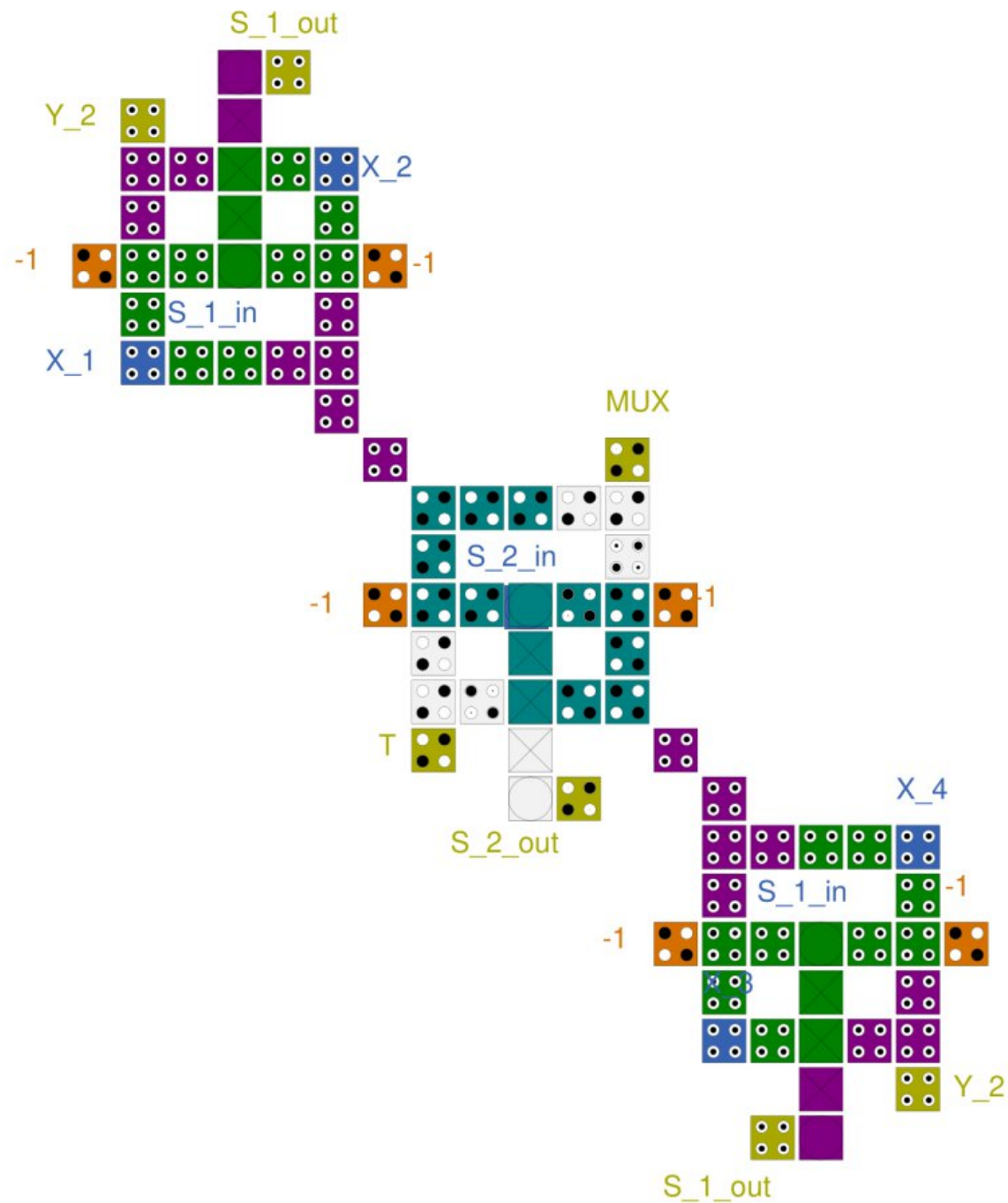


Simulation Results



Realizacija reverzibilnega 4:1
multiplekserja s QCA

Implementacija



Rezultati

| Vir | MUX | Število celic | Površina [μm^2] | Razpšritev energije [eV] | Število urinih faz | Deluje |
|-----|-----|---------------|------------------------|--------------------------|--------------------|--------|
| | 2:1 | 73 | 0.08 | 2,91e-002 eV | 3 | Da |
| | 2:1 | 68 | 0,09 | 2,71e-002 eV | 3 | Ne |
| | 2:1 | 30 | 0.03 | 2.50e-002 eV | 2 | Da |
| / | 4:1 | 92 | 0.21 | 5.00e-002 eV | 4 | Ne |