quantum_2

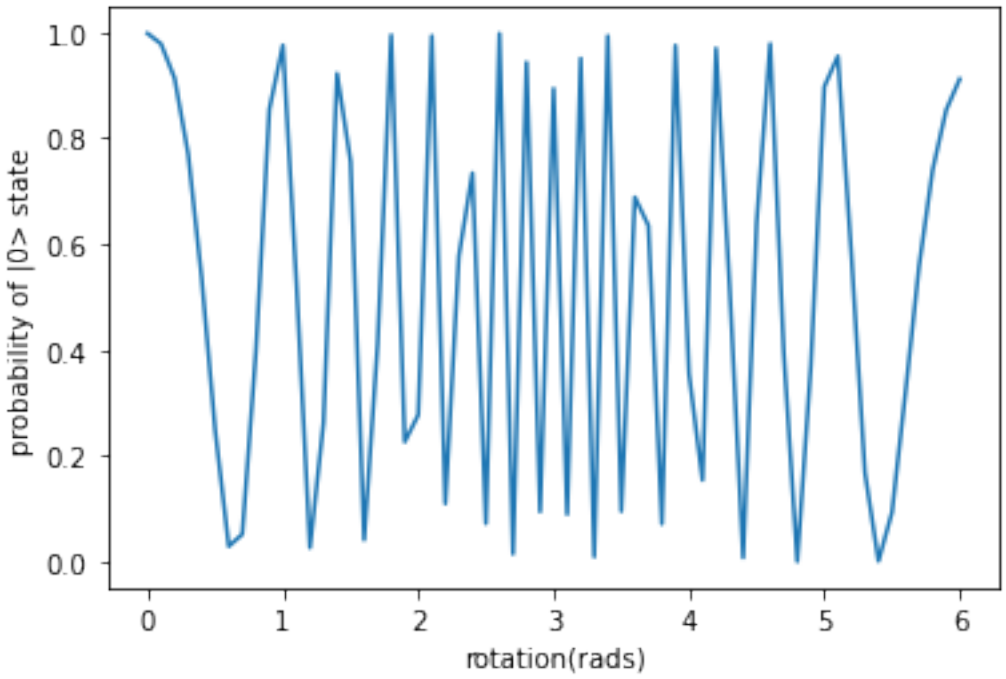
March 19, 2020

[1]:
```
import cirq
import numpy as np
from cirq import Circuit
from cirq.devices import GridQubit
from cirq import Simulator
from matplotlib import pyplot as plt

simulator = Simulator()
qbit = cirq.GridQubit(0,0)
circuit = cirq.Circuit()
x = np.arange(0.1,6.2,0.1)
for i in x:
        rot = cirq.rx(i) #rotate by small values,  e^(-i*x/2) phase shift
        circuit.append(rot(qbit))
        # print(i)

print(circuit)
li = []
x = []
for i, step in enumerate(simulator.simulate_moment_steps(circuit)):
    print(np.power(np.abs(step.state_vector()[0]), 2)+np.power(np.abs(step.
 ↪state_vector()[1]), 2)) #|a|^2 + |b|^2 =1 always(sanity check)
    li.append(np.power(np.abs(step.state_vector()[0]), 2))
    x.append(i*0.1)

plt.plot(x,li)
plt.xlabel("rotation(rads)")
plt.ylabel("probability of |0> state")
#probability of |0> is given by |a|^2
plt.show()
```

```
(0, 0):   Rx(0.032 ) Rx(0.064 ) Rx(0.095 ) Rx(0.127 ) Rx(0.159 ) Rx(0
.191 ) Rx(0.223 ) Rx(0.255 ) Rx(0.286 ) Rx(0.318 ) Rx(0.35 ) Rx(0.38
2 ) Rx(0.414 ) Rx(0.446 ) Rx(0.477 ) Rx(0.509 ) Rx(0.541 ) Rx(0.573
) Rx(0.605 ) Rx(0.637 ) Rx(0.668 ) Rx(0.7 ) Rx(0.732 ) Rx(0.764 )
Rx(0.796 ) Rx(0.828 ) Rx(0.859 ) Rx(0.891 ) Rx(0.923 ) Rx(0.955 ) Rx
(0.987 ) Rx(1.019 ) Rx(1.05 ) Rx(1.082 ) Rx(1.114 ) Rx(1.146 ) Rx(1.
178 ) Rx(1.21 ) Rx(1.241 ) Rx(1.273 ) Rx(1.305 ) Rx(1.337 ) Rx(1.369
```

) Rx(1.401) Rx(1.432) Rx(1.464) Rx(1.496) Rx(1.528) Rx(1.56)
Rx(1.592) Rx(1.623) Rx(1.655) Rx(1.687) Rx(1.719) Rx(1.751)
Rx(1.783) Rx(1.814) Rx(1.846) Rx(1.878) Rx(1.91) Rx(1.942)
1.0000000179786337
1.000000122497678
1.0000000300920142
1.0000000657104353
1.0000000934561015
1.0000001549706292
1.000000120779334
1.0000001201219177
1.0000001179954907
1.0000001298200667
1.0000001072079252
1.0000002063731905
1.0000001428172434
1.0000001301968098
1.0000001561791017
1.0000001463623818
1.000000212007568
1.0000002677541602
1.0000004104986715
1.0000003515223348
1.0000003697417839
1.0000003350693056
1.000000414319416
1.0000003779165354
1.0000003788125653
1.0000004424485383
1.0000005168592419
1.0000005044549471
1.0000004337639423
1.0000004265516793
1.0000003527917523
1.0000002616530033
1.0000001746777605
1.0000001660960303
1.0000002247689679
1.000000251879638
1.0000001999340498
1.000000198259702
1.0000002515999151
1.0000002439918687
1.0000002224583682
1.0000003400718294
1.0000003182590866
1.0000004107659066
1.0000004957946267

```
1.0000004749455123
1.000000515055846
1.0000005485962937
1.0000004149925026
1.0000002411727138
1.0000002004397723
1.0000002162317658
1.0000001441153366
1.0000001153532176
1.0000001753177585
1.000000224767633
1.0000001084506565
1.0000000948173415
1.0000001046157827
0.9999999935545567
0.9999999003071913
```



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