In[ ]:=
```
(*A1=383;
A2=403;
A3=208;*)

k1 = Mod[A1 + A2 + A3, 2];
k2 = Mod[A1 + A2 + A3, 2^2];
k3 = Mod[A1 + A2 + A3, 2^3];

θ0 = π / k2;
ϕ0 = 2 π / k3;

|0⟩ := {{1}, {0}};
|1⟩ := {{0}, {1}};

u1[ϕ_] := ( 1   0
            0   e^(I*ϕ) );
u3[θ_, 0, 0] := ( Cos[θ/2]   Sin[θ/2]
                  -Sin[θ/2]  Cos[θ/2] );
```

In[ ]:=
```
(u1[ϕ0].u3[θ0, 0, 0].|0⟩) // MatrixForm
```

Out[ ]//MatrixForm=

$$\begin{pmatrix} \frac{1}{\sqrt{2}} \\ \frac{1}{\sqrt{2}} \end{pmatrix}$$