In[ ]:=
```
Px[0x] = 1;
Px[1x] = 0;
Py[0y] = 0.485;
Py[1y] = 0.515;
Pz[0z] = 0.515;
Pz[1z] = 0.485;

|0⟩ := {{1}, {0}};
|1⟩ := {{0}, {1}};

Pwx = Px[0x] - Px[1x];
Pwy = Py[0y] - Py[1y];
Pwz = Pz[0z] - Pz[1z];
Pwb = {Pwx, Pwy, Pwz}
```

Out[ ]= {1, −0.03, 0.03}

In[ ]:=
```
Pwb2 = Pwb.Pwb
```

Out[ ]= 1.0018

In[ ]:=
```
WB = 1 / (√Pwb2) * Pwb
```

Out[ ]= {0.999101, −0.029973, 0.029973}

In[ ]:=
```
σ = {{{{0, 1}, {1, 0}}}, {{{0, -i}, {i, 0}}}, {{{1, 0}, {0, -1}}}}
```

Out[ ]= {{{{0, 1}, {1, 0}}}, {{{0, −i}, {i, 0}}}, {{{1, 0}, {0, −1}}}}

In[ ]:=
```
σ // MatrixForm
```

Out[ ]//MatrixForm=

$$\begin{pmatrix} \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix} \\ \begin{pmatrix} 0 & -i \\ i & 0 \end{pmatrix} \\ \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix} \end{pmatrix}$$

In[ ]:=
```
(σWB = Flatten[WB.σ, 1]) // MatrixForm
```

Out[ ]//MatrixForm=

$$\begin{pmatrix} 0.029973 + 0.\,i & 0.999101 + 0.029973\,i \\ 0.999101 - 0.029973\,i & -0.029973 + 0.\,i \end{pmatrix}$$

In[ ]:=
```
(wwWB = Eigensystem[σWB]) // MatrixForm
```

Out[ ]//MatrixForm=

$$\begin{pmatrix} -1. & 1. \\ \{0.696116 + 0.0208835\,i, -0.717626 + 0.\,i\} & \{0.717303 + 0.0215191\,i, 0.696429 + 0.\,i\} \end{pmatrix}$$

In[ ]:=
$$\left(\left|w\right\rangle = \{\{wwWB[[2,\ 2,\ 1]]\},\ \{wwWB[[2,\ 2,\ 2]]\}\}\right) // \text{MatrixForm}$$

Out[ ]//MatrixForm=
$$\begin{pmatrix} 0.717303 + 0.0215191\,i \\ 0.696429 + 0.\,i \end{pmatrix}$$

In[ ]:=
$$\left\langle w\right| = \text{Simplify}\left[\left|w\right\rangle^{\dagger}\right]$$

Out[ ]=
$$\{\{0.717303 - 0.0215191\,i,\ 0.696429 + 0.\,i\}\}$$

In[ ]:=
$$\text{normawb2} = \left(\text{Flatten}\left[\text{Chop}\left[\left\langle w\right| . \left|w\right\rangle\right]\right][[1]]\right)$$

Out[ ]=
$$1.$$

In[ ]:=
$$\left(\left|uw\right\rangle = 1 / \left(\sqrt{\text{normawb2}}\right) * \left|w\right\rangle\right) // \text{MatrixForm}$$

Out[ ]//MatrixForm=
$$\begin{pmatrix} 0.717303 + 0.0215191\,i \\ 0.696429 + 0.\,i \end{pmatrix}$$

In[ ]:=
```
C0 = (|uw⟩[[1, 1]]);
C1 = (|uw⟩[[2, 1]]);
ϕ0 = Arg[C0];
ϕ1 = Arg[C1];
mC0 = Abs[C0];
mC1 = Abs[C1];
ϕw = ϕ1 − ϕ0
```

Out[ ]=
$$-0.029991$$

In[ ]:=
$$\left|\psi d\right\rangle = \text{Chop}\left[mC0\ \left|0\right\rangle + e^{\text{Defer}[i]\,\phi w}\ mC1\ \left|1\right\rangle\right]$$

Out[ ]=
$$\left\{\{0.717626\},\ \left\{0.696429\,e^{-0.029991\,i}\right\}\right\}$$

In[ ]:=
$$\left(\left|\psi d\right\rangle\right) // \text{MatrixForm}$$

Out[ ]//MatrixForm=
$$\begin{pmatrix} 0.717626 \\ 0.696429\,e^{-0.029991\,i} \end{pmatrix}$$

In[ ]:=
$$\begin{pmatrix} 0.7176256114421402` \\ 0.6964290931618914`\,e^{-0.02999100485687792`\,i} \end{pmatrix} // N // \text{MatrixForm}$$

Out[ ]//MatrixForm=
$$\begin{pmatrix} 0.717626 \\ 0.696116 - 0.0208835\,i \end{pmatrix}$$