$$|0\rangle = |s\rangle_1 |s\rangle_2$$

$$|1\rangle = \frac{1}{\sqrt{2}}|s\rangle_1 |s-1\rangle_2$$

$$+ \frac{1}{\sqrt{2}}|s-1\rangle_1 |s\rangle_2$$

$$|\chi\rangle = \cos(\frac{\tilde{\theta}}{2})|0\rangle$$

$$+ \sin(\frac{\tilde{\theta}}{2})e^{i\tilde{\phi}}|1\rangle$$