



Diagram illustrating a two-level system (qubit) with ground state  $|\Psi\rangle_{\text{GS}}$ .

The ground state  $|\Psi\rangle_{\text{GS}}$  is represented by the blue circle (labeled 1). The excited state is represented by the red circle.

Mathematical expression above the ground state:

$$\alpha \hat{n}_{1\uparrow} \hat{n}_{1\downarrow}$$