$HP_\varphi H$

$$P_0 = \frac{1 + \langle m_0 | m_1 \rangle \cos\varphi}{2} \quad \text{vs.} \quad P_0 = \frac{1 + \cos\varphi}{2}$$

$$P_1 = \frac{1 - \langle m_0 | m_1 \rangle \cos\varphi}{2} \quad \text{vs.} \quad P_1 = \frac{1 - \cos\varphi}{2}$$

$$P_0 \simeq P_1 \simeq \frac{1}{2}$$

$$|\psi\rangle = \alpha|0\rangle + \beta|1\rangle \rightarrow \alpha|0\rangle|m_0\rangle + \beta|1\rangle|m_1\rangle$$

$$|m_0\rangle \neq |m_1\rangle \quad , \quad |m_0\rangle \simeq |m_1\rangle$$

$$|\psi\rangle|m\rangle = (\alpha|0\rangle + \beta|1\rangle)|m\rangle \rightarrow \alpha|0\rangle|m_0\rangle + \beta|1\rangle|m_1\rangle$$

$$|0\rangle|000\rangle \rightarrow (|0\rangle+|1\rangle)(|0\rangle+|1\rangle)(|0\rangle+|1\rangle)$$

$$|1\rangle|000\rangle \rightarrow (|0\rangle-|1\rangle)(|0\rangle-|1\rangle)(|0\rangle-|1\rangle)$$

1 0 1 0 1 1

0 0 0 0 0 0 | 2 - exact match

1 0 0 0 0 0 | 3 - exact match

1 1 0 0 0 0 | 2

1 0 1 0 0 0 | 4

1 0 1 1 0 0 | 3

1 0 1 0 1 0 | 5

1 0 1 0 1 1 | 6

000000
000001
000010
000100
001000
010000
100000

1010
0000|2
1100|2
0100|1

0000	4
0001	3
0010	3
0011	2
0100	3
0101	2
0110	2
0111	1

1000	3
1001	2
1010	2
1011	1
1100	2
1101	1
1110	1
1111	0

0100

3	2 × 1100
1	1 × 1001
1	1 × 1010
1	2 × 0011
3	1 × 0101
3	1 × 0110

flip the first bit

2 × 0100
0001
0010
2 × 1011
1101
1110

4 × 1010
2 × 1001
2 × 0011

2 × 1010
1001
0011