L_z

$2\hbar$
$\hbar$

$m_l = 2$
$m_l = 1$
$m_l = 0$

$l = 2$

$L = \sqrt{l(l+1)}\hbar$
$= \sqrt{6}\hbar$

$-\hbar$
$-2\hbar$

$m_l = -1$
$m_l = -2$