一　外电场对电偶极子的力矩和取向作用

◆　匀强电场中

$$\vec{F} = \vec{F}_+ + \vec{F}_-$$

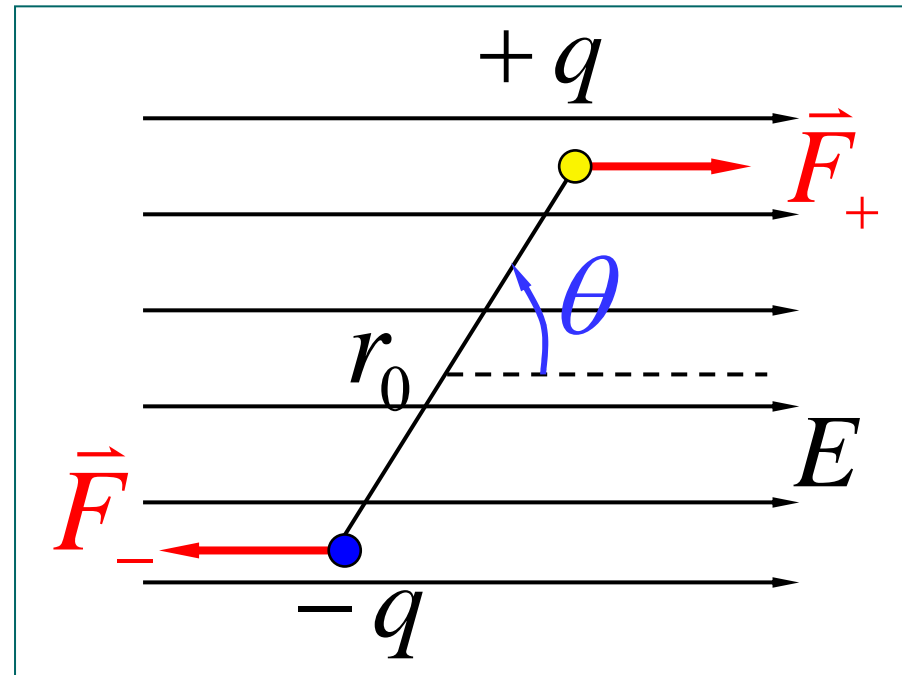$$= q\vec{E} - q\vec{E} = 0$$

$$M = qr_0 E \sin\theta$$

$$= pE \sin\theta$$

$$\vec{M} = \vec{p} \times \vec{E} \quad \begin{cases} \theta = 0 \\ \theta = \pi \end{cases}$$

$\vec{M} = 0$

稳定平衡

非稳定平衡

◆　非匀强电场中 $\vec{F} = \vec{F}_+ + \vec{F}_- = q\vec{E}_+ - q\vec{E}_- \neq 0$

二　电偶极子在电场中的电势能和平衡位置

$$E_p = qV_+ - qV_-$$

$$= -q(-\frac{V_+ - V_-}{r_0 \cos\theta})r_0 \cos\theta$$

$$= -qr_0 E \cos\theta$$

$$E_p = -\vec{p} \cdot \vec{E}$$

$\theta = 0$	$E_p = -p \cdot E$	能量最低
$\theta = \pi/2$	$E_p = 0$	
$\theta = \pi$	$E_p = p \cdot E$	能量最高