

$$\dot{x} = \underbrace{\epsilon c \cos(kx - \omega t) e^{kz}}_{u'} + \epsilon^2 u_2(x, z, t) + \dots$$

$$\dot{z} = \underbrace{\epsilon c \sin(kx - \omega t) e^{kz}}_{w'} + \epsilon^2 w_2(x, z, t) + \dots$$