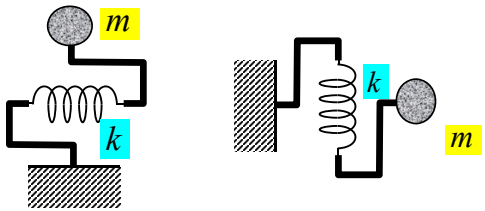
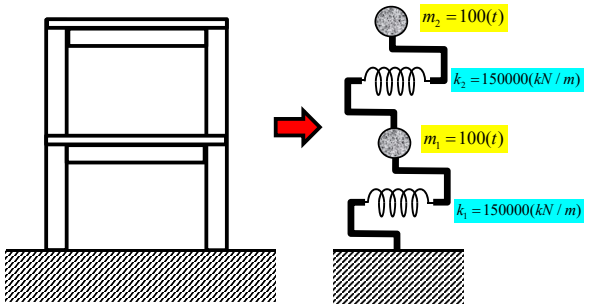
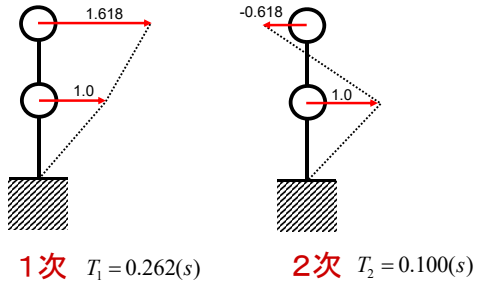
重力式による1質点系の固有周期



例題① 重力式で固有周期を求めよ



振動モード



1次 $T_1 = 0.262(s)$　　2次 $T_2 = 0.100(s)$

多質点系の地震応答の解き方

Newmark-β法(SDOF)

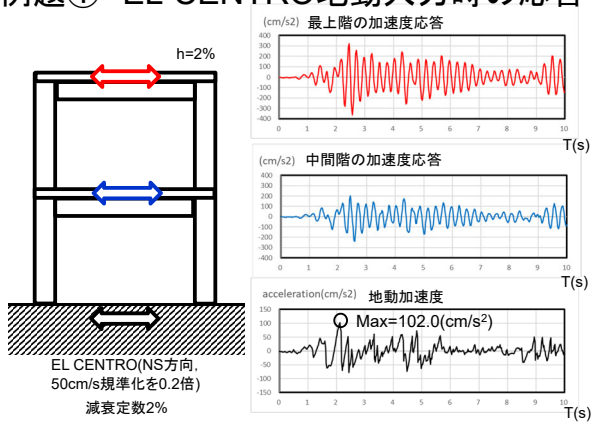
$$x_{n+1} = x_n + \frac{m\left(\frac{4}{\Delta t}\dot{x}_n + 2\ddot{x}_n - (\ddot{y}_{n+1} - \ddot{y}_n)\right) + 2c\dot{x}_n}{\frac{4}{\Delta t^2}m + \frac{2}{\Delta t}c + k}$$

⇩

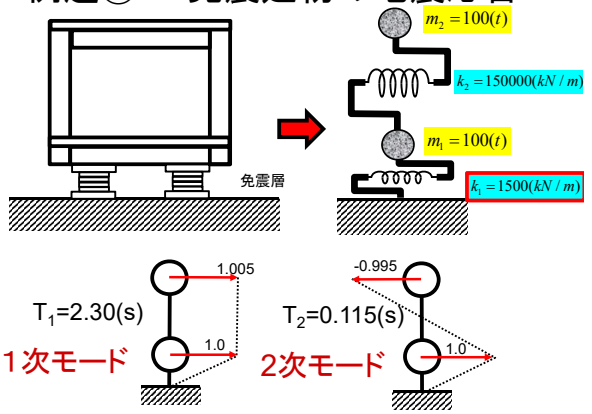
Newmark-β法(MDOF)

$$\{x\}_{n+1} = \{x\}_n + \left(\frac{4}{\Delta t^2}[M] + \frac{2}{\Delta t}[C] + [K]\right)^{-1}$$
$$\left[[M]\left(\frac{4}{\Delta t}\{\dot{x}\}_n + 2\{\ddot{x}\}_n - \{v\}(\ddot{y}_{n+1} - \ddot{y}_n)\right) + 2[C]\{\dot{x}\}_n\right]$$

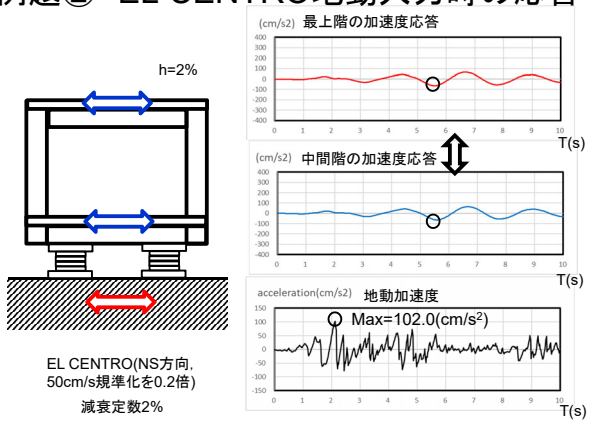
例題① EL CENTRO地動入力時の応答



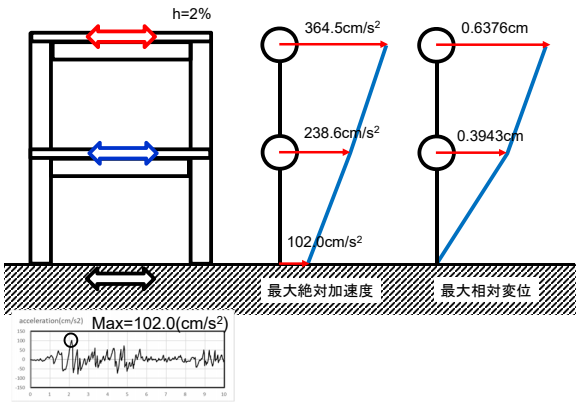
例題② 免震建物の地震応答



例題② EL CENTRO地動入力時の応答



例題①の最大応答分布，その1



例題①の最大応答分布，その2