

# Passive Structural Control (HW 2)

Due: 4/4

## 1. Response spectrum

Using numerical integration method (**Duhamel Integral** and **Newmark  $\beta$  Method**) to calculate absolute acceleration spectrum  $S_a$ , absolute velocity spectrum  $S_v$ , pseudo-velocity spectrum  $PS_v$  and pseudo-acceleration spectrum  $PS_a$  with attached ground motion time histories with damping ratios 2%, 5%, 10%, 20% and 40%.

※Note:

The units of the attached files are in “sec, gal”.

(1) Near-fault earthquake record: **TCU052.txt**

(2) Far-fault earthquake record: **TCU072.txt**

(3) 1<sup>st</sup> column is time interval data; the 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> columns are acceleration records of vertical, NS direction, and EW direction, respectively.

**Only needs to consider the EW direction.**

**You are required to discuss your results ( $S_a$ ,  $PS_a$ ,  $S_v$  and  $PS_v$ ) including:**

- a. different numerical integration method
- b. different damping ratio
- c. near-fault and far-fault difference

**You should provide your codes (MATLAB or others) in the report.**

## 2. Reading Assignment

You have to write down what you have learned from the reading assignment in one A4 page.

file: Reading assignment\_反應譜.pdf