Basics of stochastic mechanics

Project „Group B“

WS12/13

Prof. Bucher

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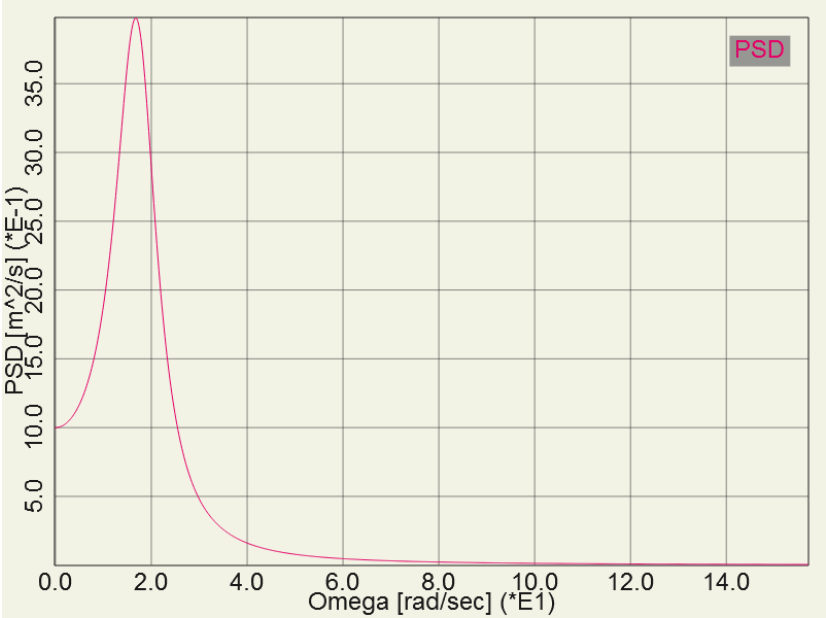
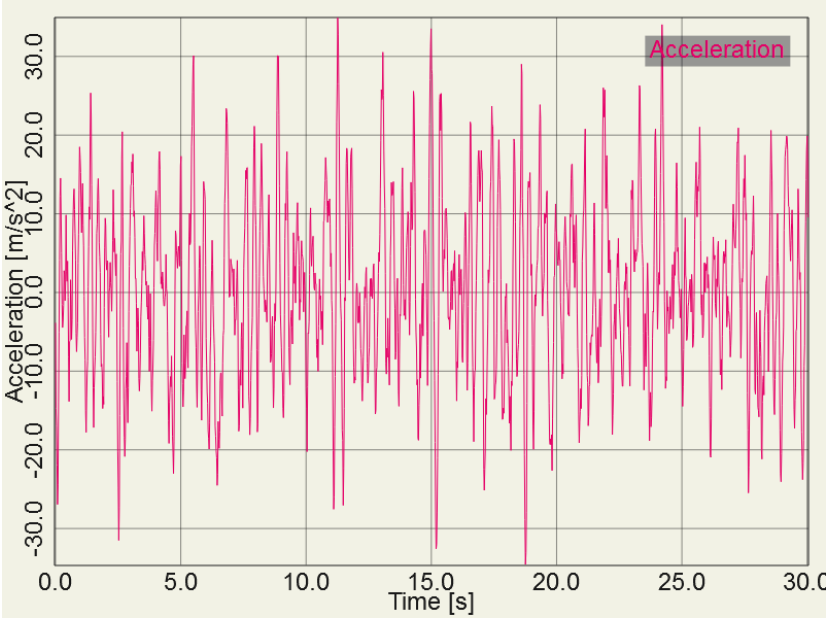
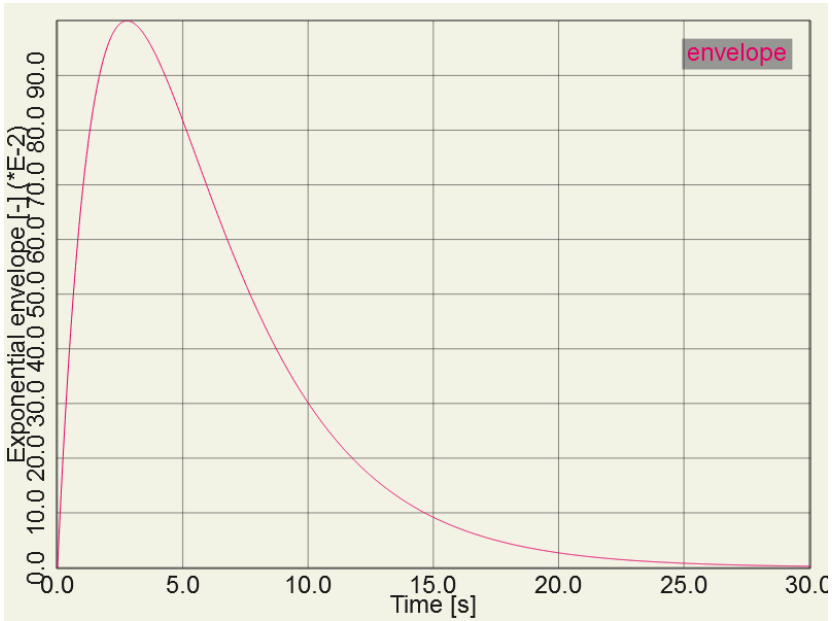
- Power Spectral Density

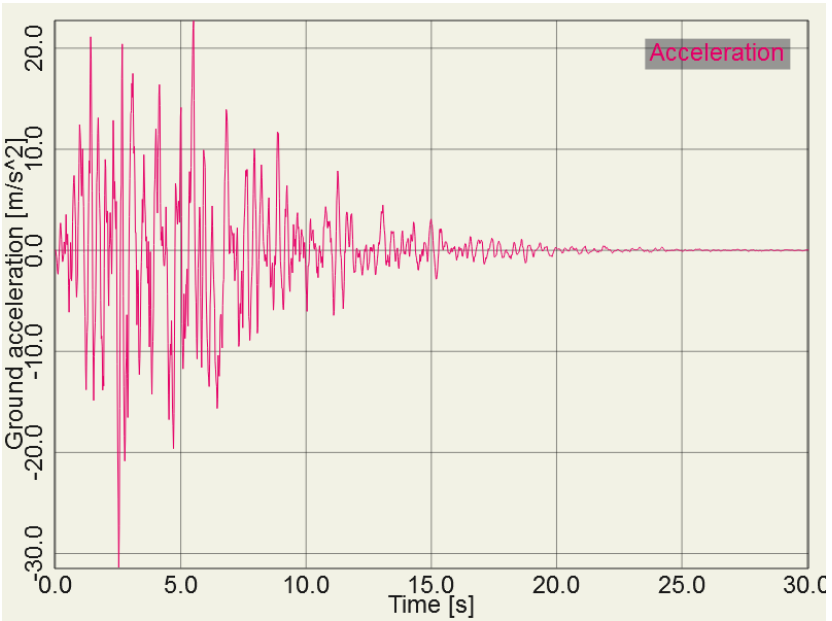




Envelope Function

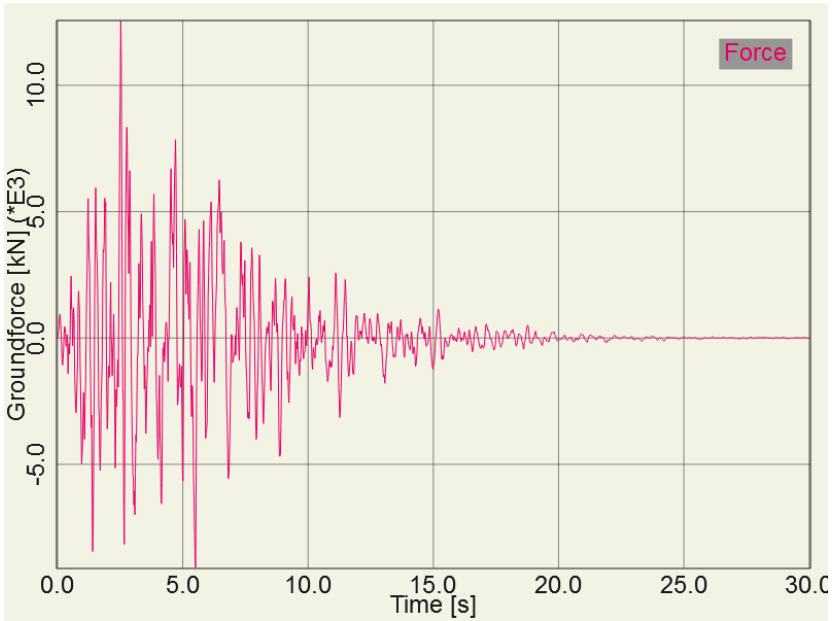
- Filter Function



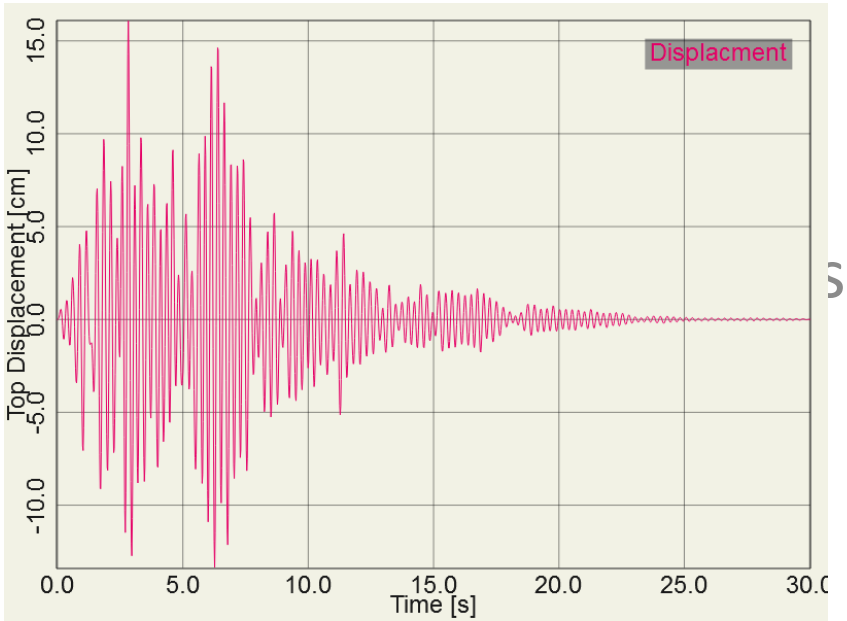


Excitation- Response

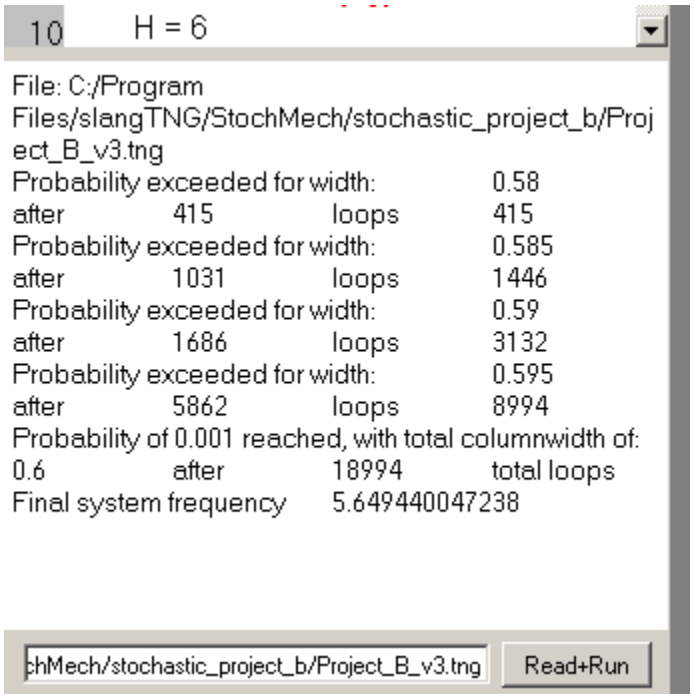
- Groundforce



- Response of the structure



The Solution:



H=6 m

M=400 t

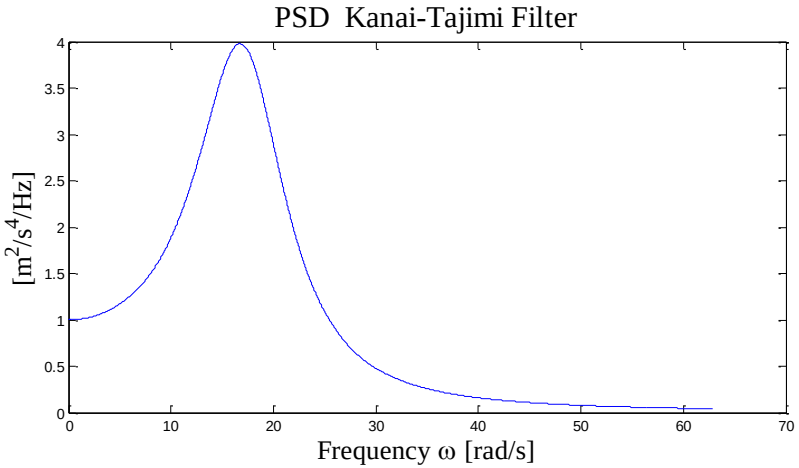
ζ=0.02

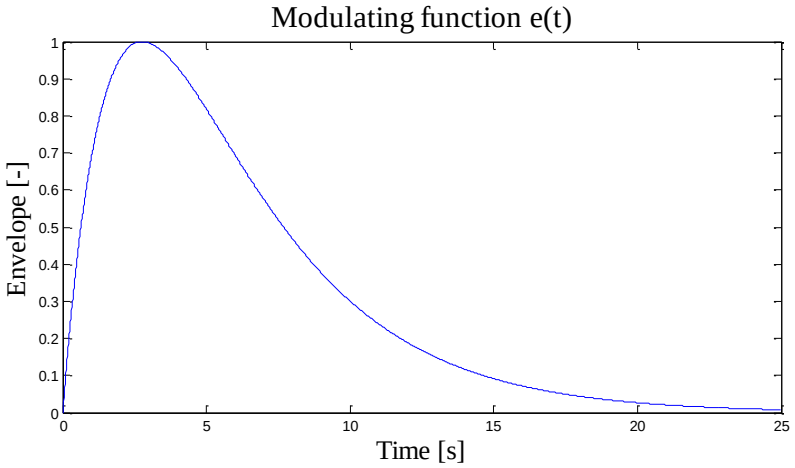
S_0=1.0 m²/s

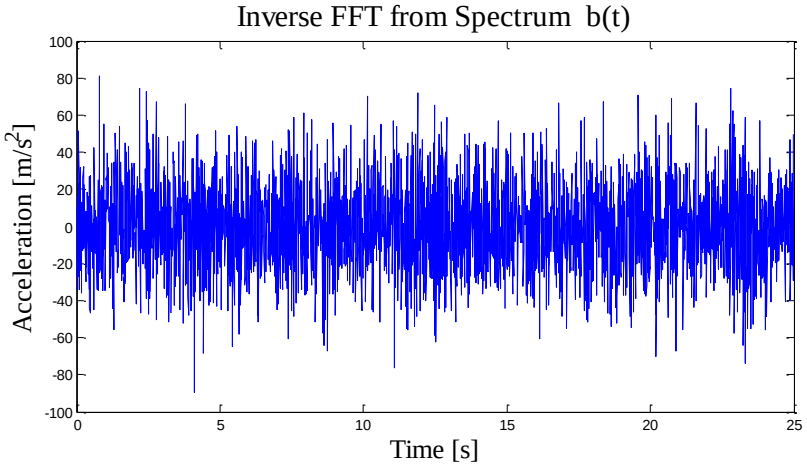
ω_g=1.8 rad/s

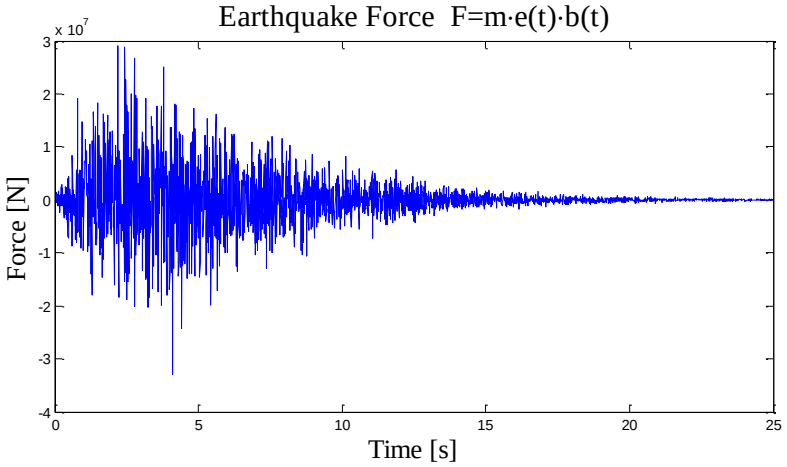
ζ_g=0.3

ξ=100 mm

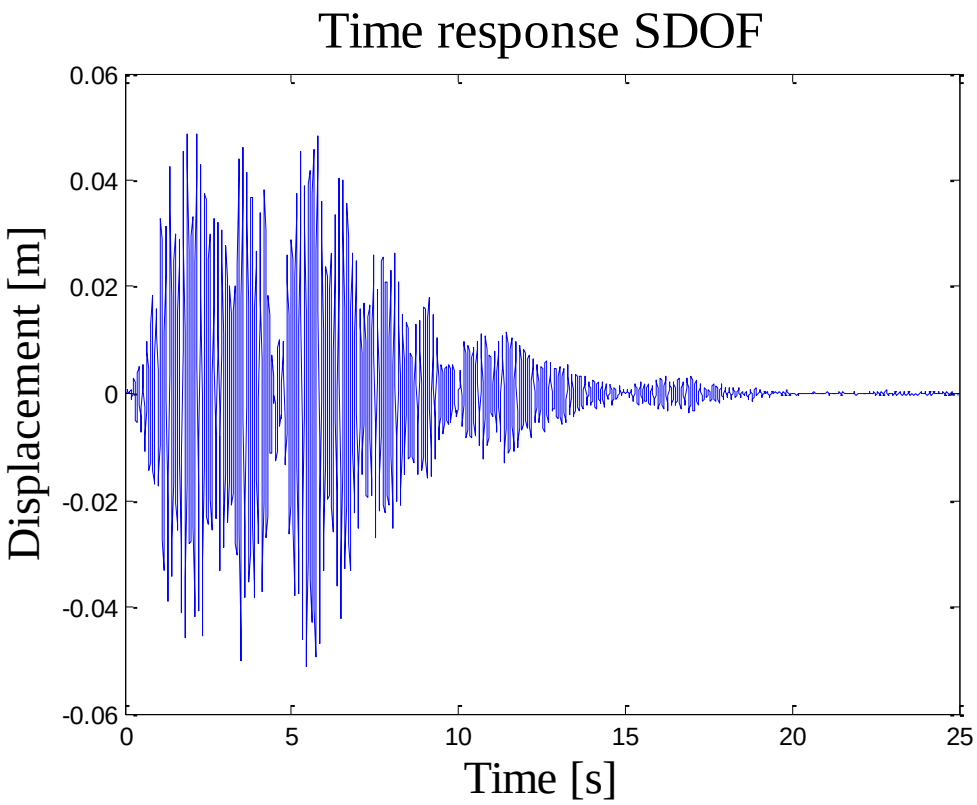

PSD Kanai-Tajimi Filter
[m²/s⁴/Hz]
Frequency ω [rad/s]

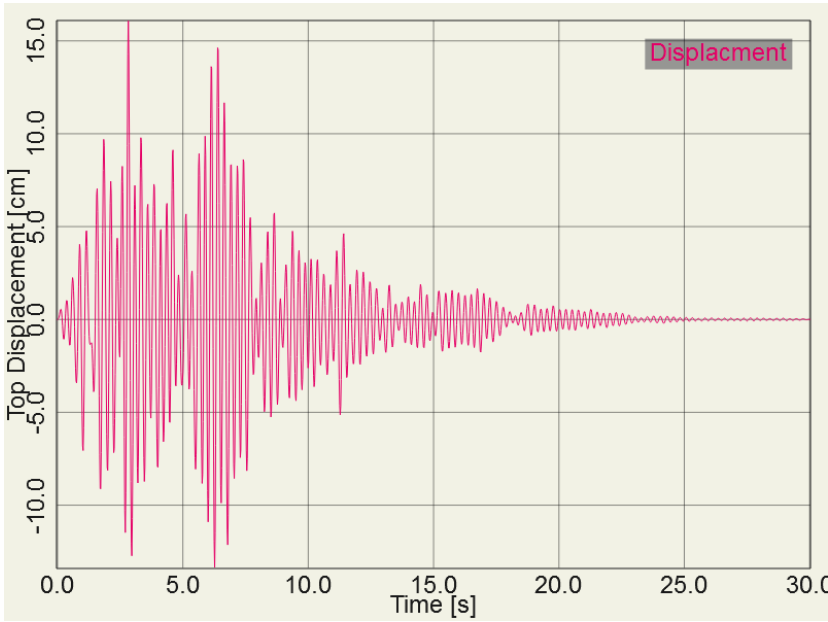

Modulating function e(t)
Envelope [-]
Time [s]


Inverse FFT from Spectrum b(t)
Acceleration [m/s²]
Time [s]


Earthquake Force F=m·e(t)·b(t)
x 10⁷
Force [N]
Time [s]

Results





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