

OBNOVA GRADA ZAGREBA NAKON POTRESA
Ciklus predavanja: Znanjem za Zagreb (i Hrvatsku) - Zagrebu od Rijeke

Ponašanje tla pod djelovanjem potresa

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Sadržaj

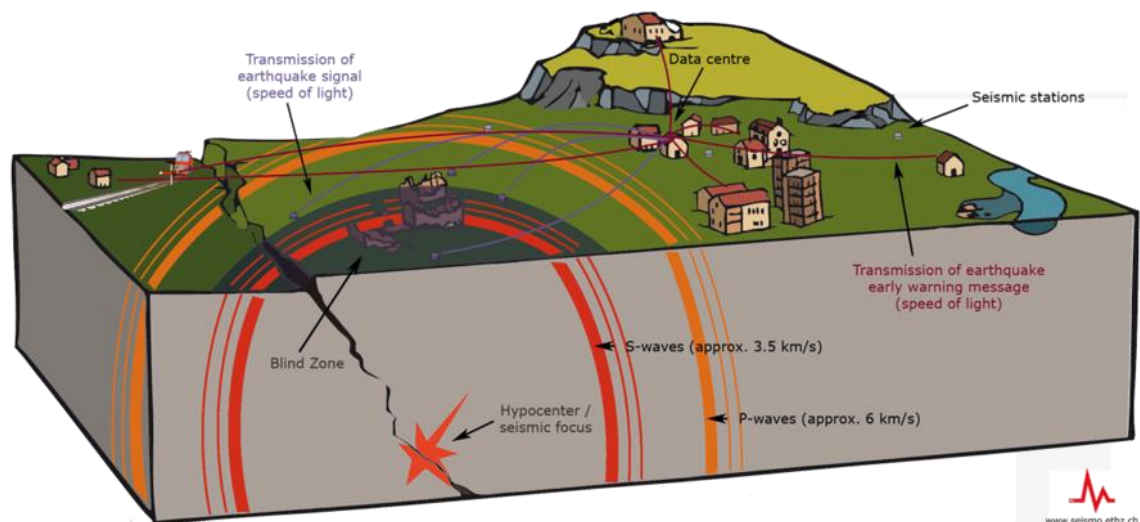
- Uvodno
- Odziv tla na seizmičku pobudu
- Vrste laboratorijskih pokusa
- Vrste laboratorijske opreme
- Karakteristični rezultati cikličkog djelovanja na tlo
- Umjesto zaključka

Uvodno

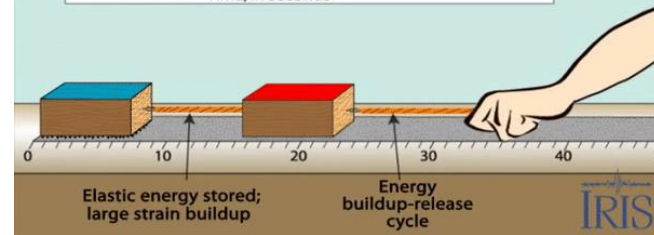
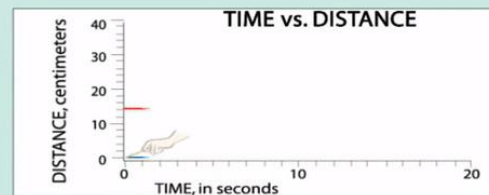
G

F

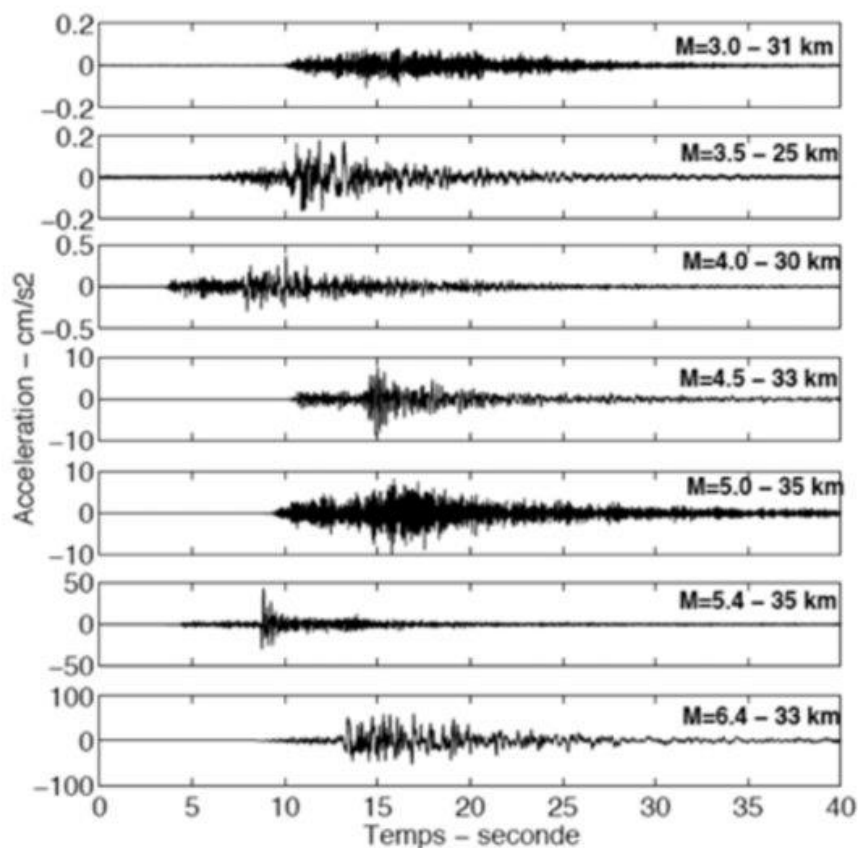
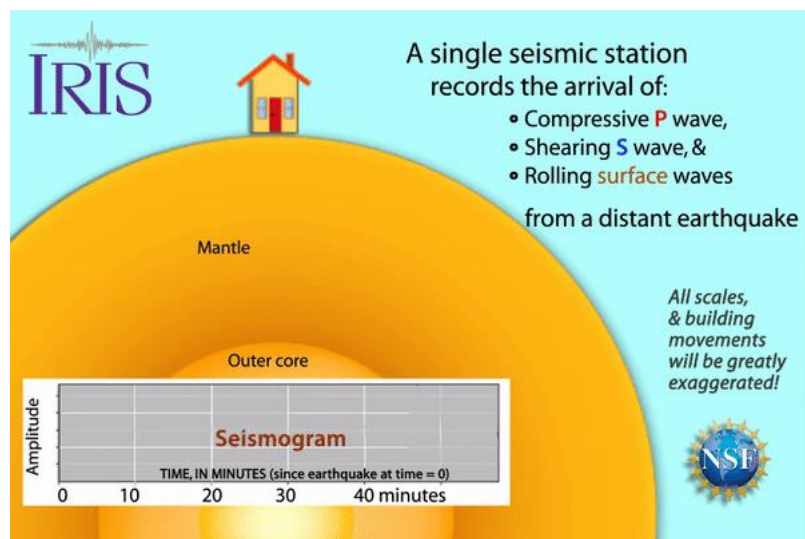
Što je potres i kako nastaje?



Graphing the 2-block "Earthquake Machine"

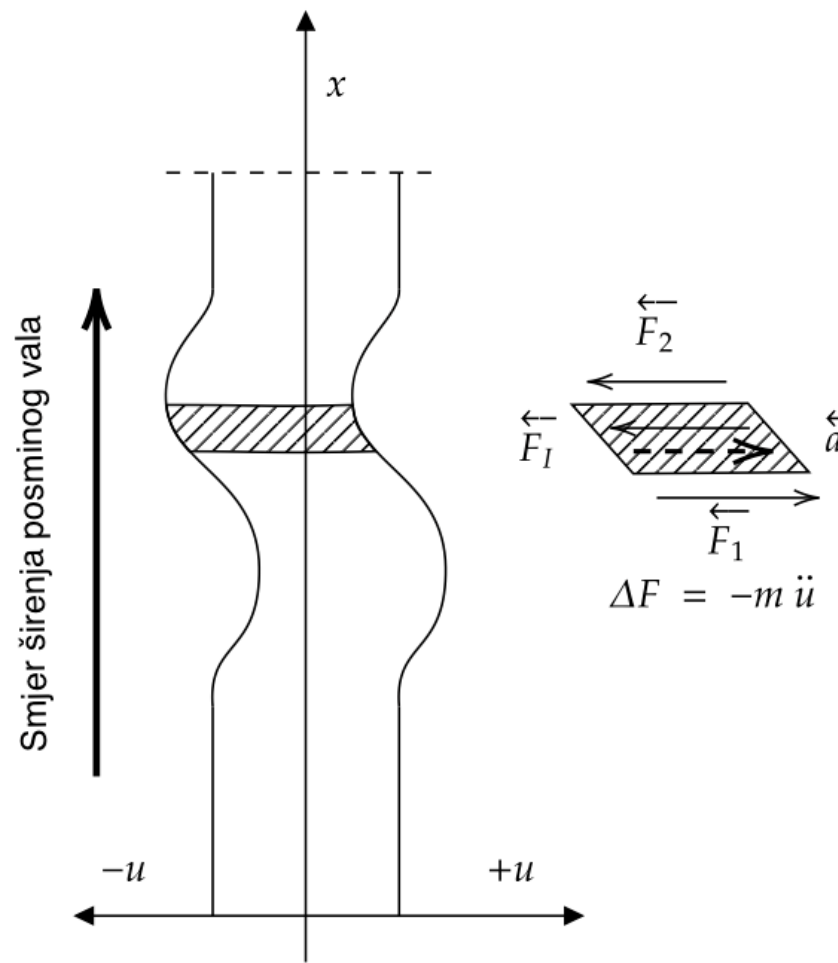


Posljedica potresa – širenje valova

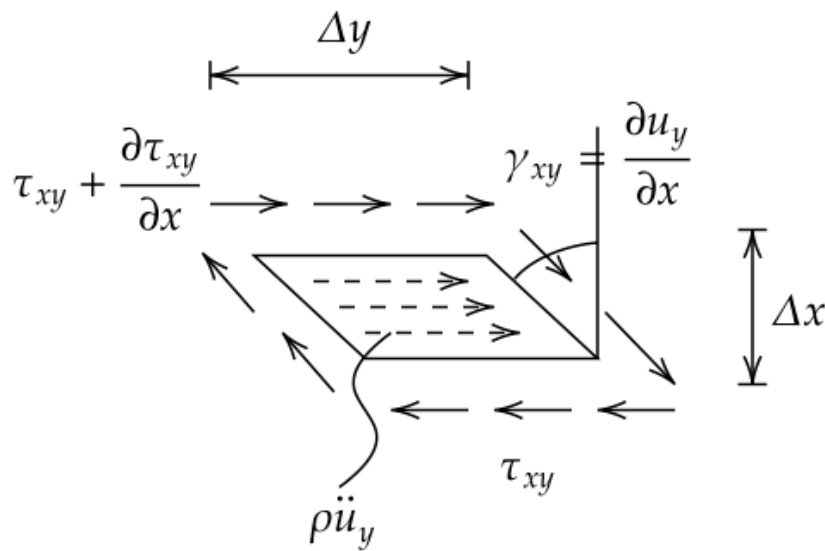


Bard (2011)

Širenje posmičnih valova



Širenje posmičnih valova

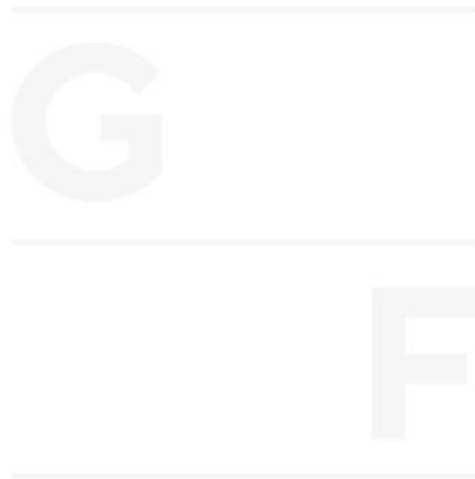


$$\frac{\partial \tau_{xy}}{\partial x} - \rho \cdot \ddot{u}_y = 0$$

$$\tau_{xy} = G \cdot \frac{\partial u_y}{\partial x}$$

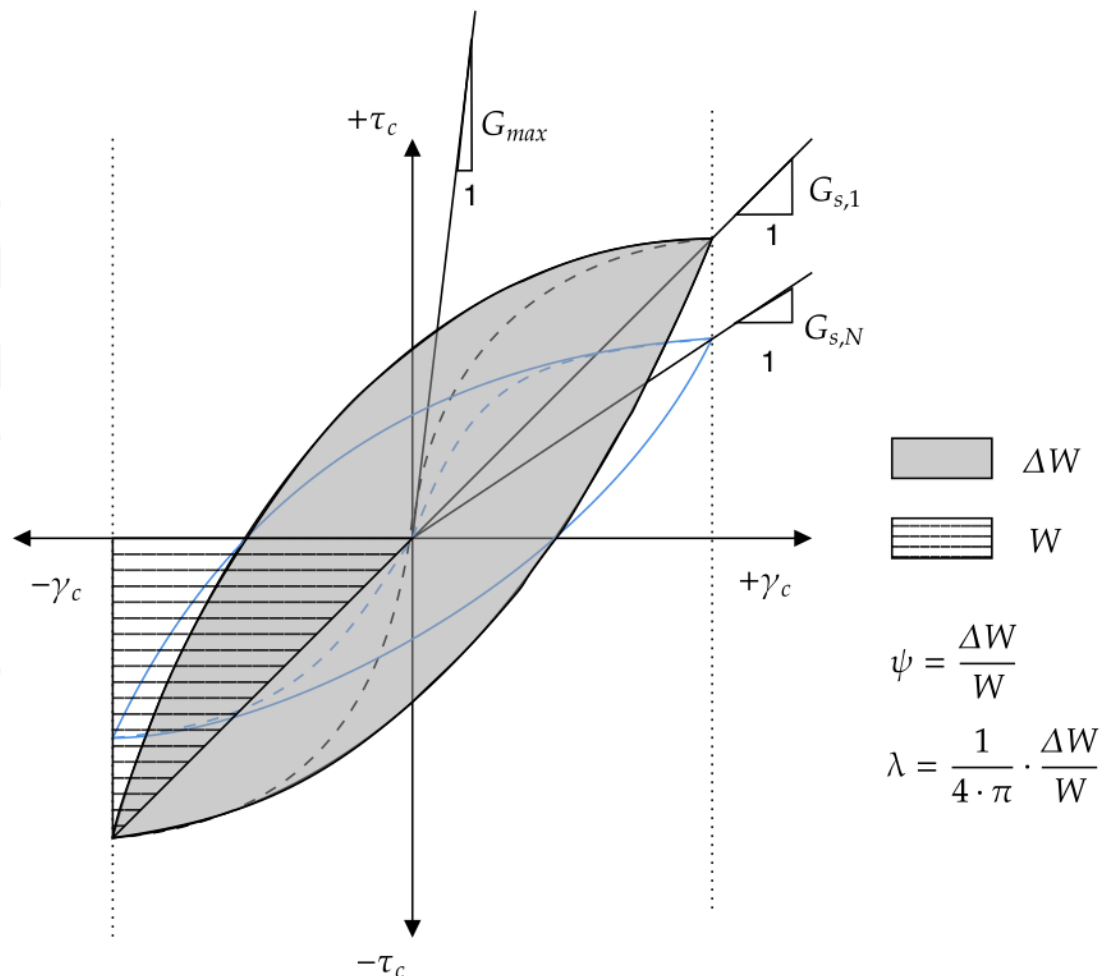
$$G = v_s^2 \cdot \rho$$

Odziv tla na seizmičku pobudu

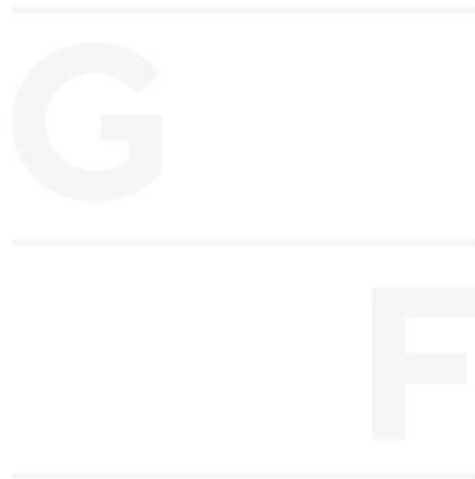


Širenje posmičnih valova

- Element tla izložen je cikličkim posmičnim deformacijama/naprezanjima uslijed širenja posmičnih valova te se ponašanje elementa tla može prikazati cikličkom petljom



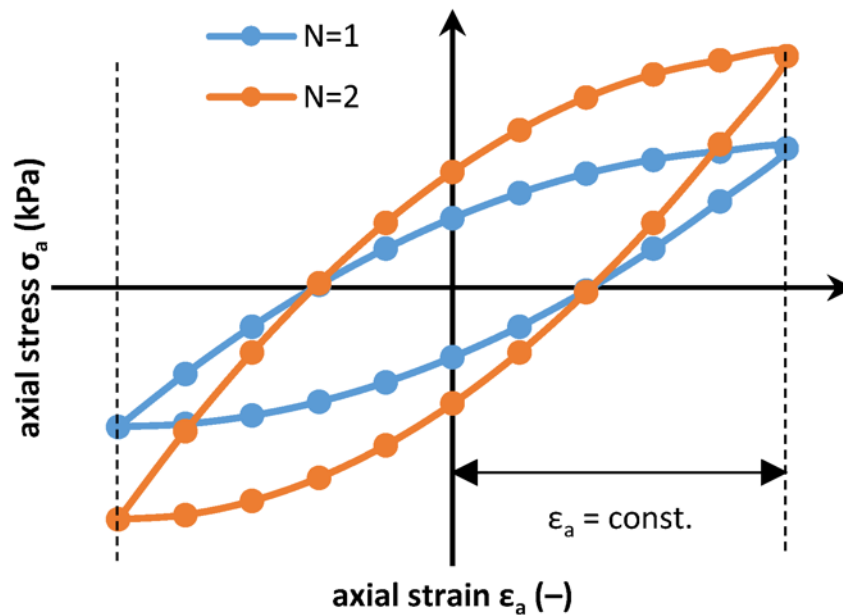
Vrste laboratorijskih pokusa



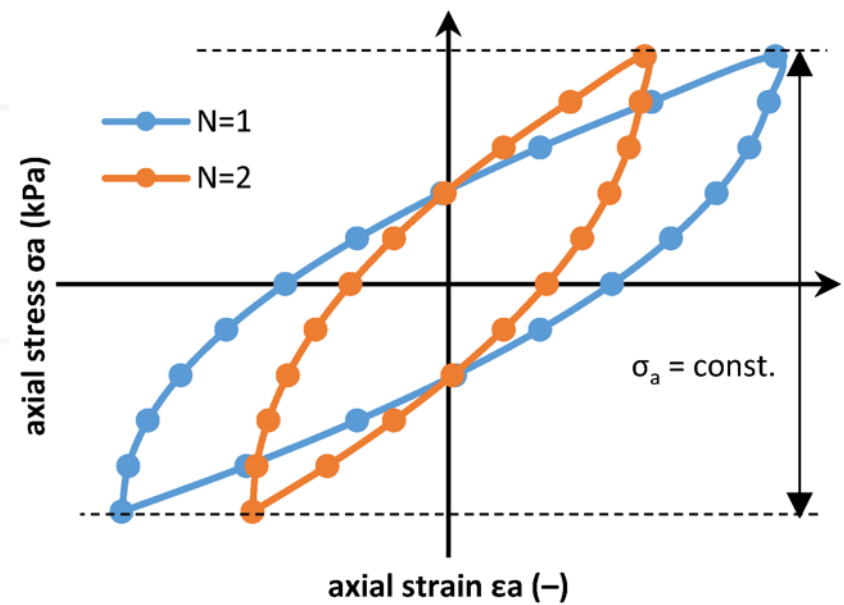
Pokus sa konstantnom deformacijom ili konstantnim naprezanjem

Głuchowski and Sas (2020)

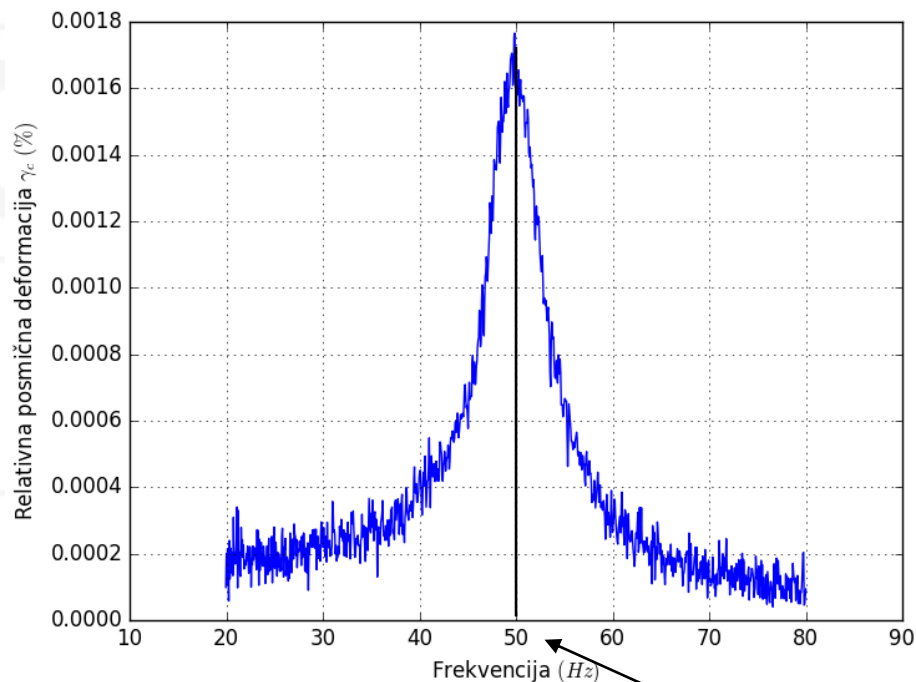
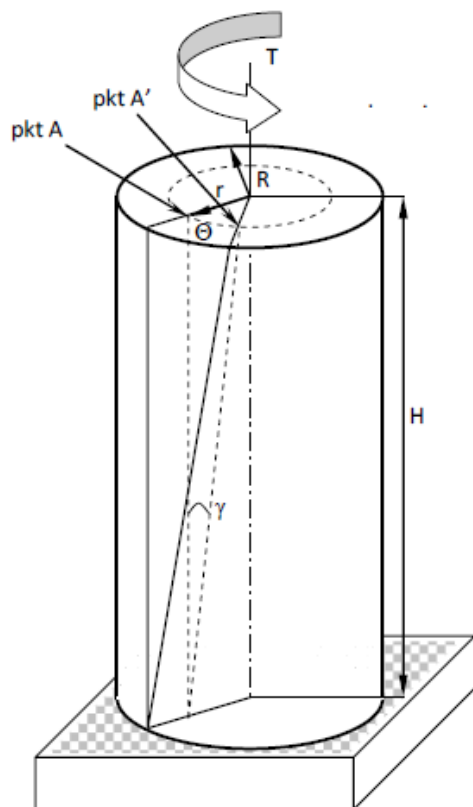
Konstantna deformacija



Konstantno naprezanje

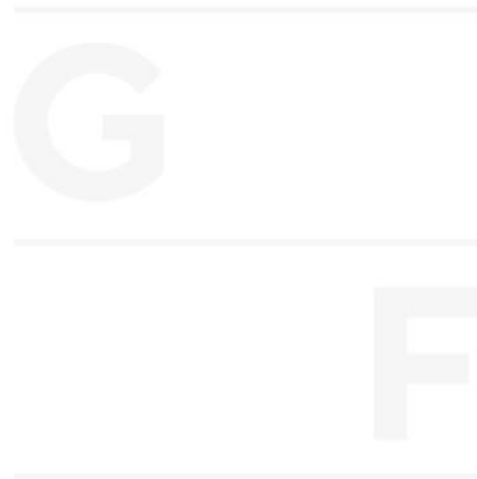


Pokus rezonantnog stupca

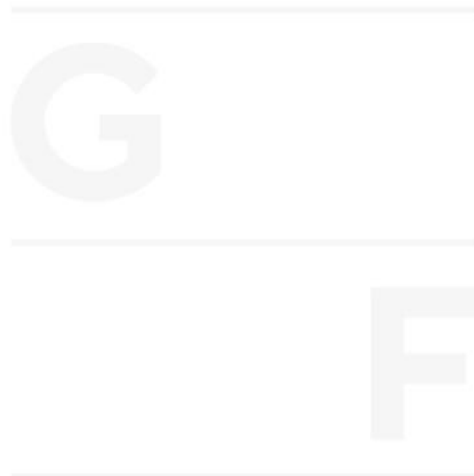


Rezonantna frekvencija

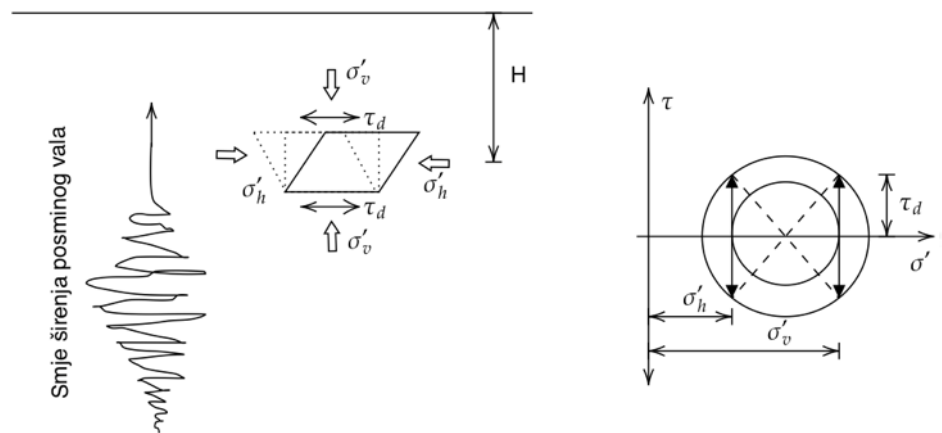
Nerazorne metode zasnovane na širenju posmičnih valova



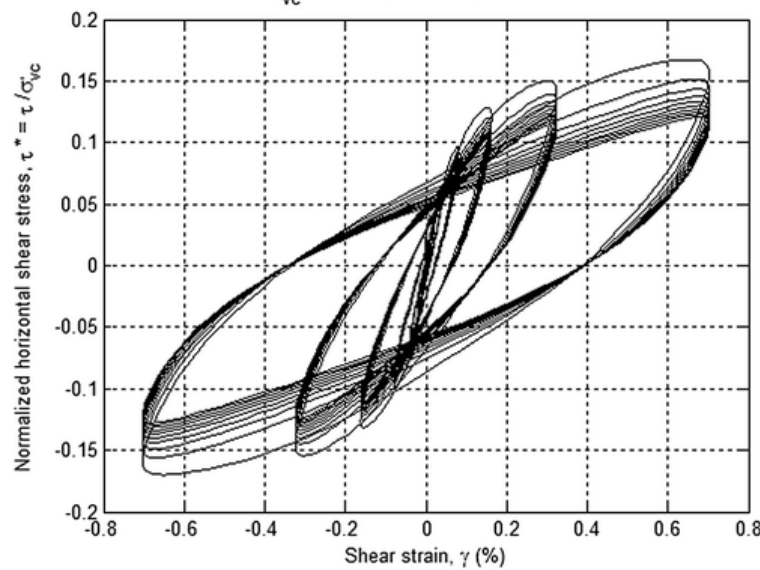
Vrste laboratorijskih uređaja



Uređaj za jednostavno smicanje

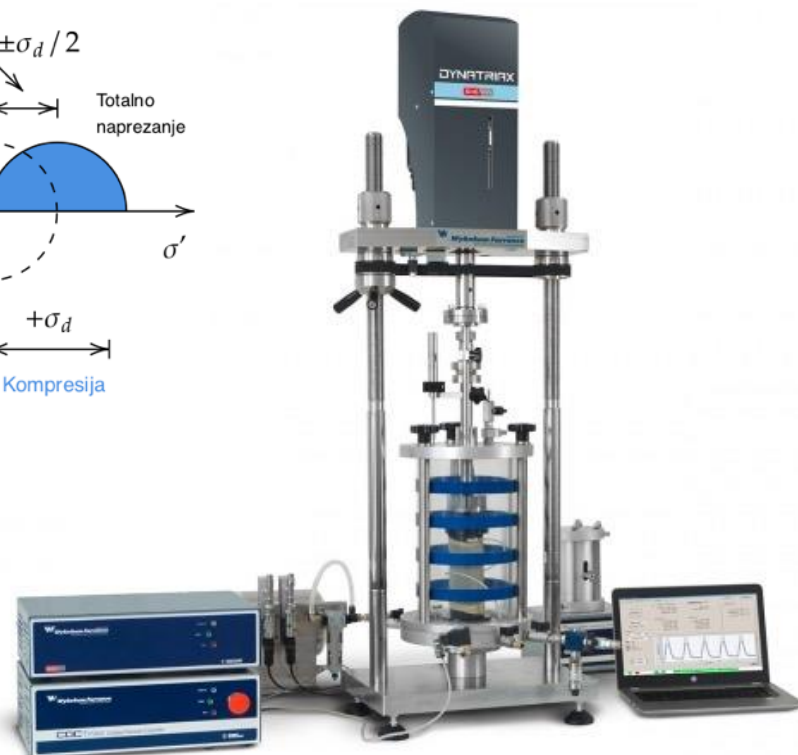
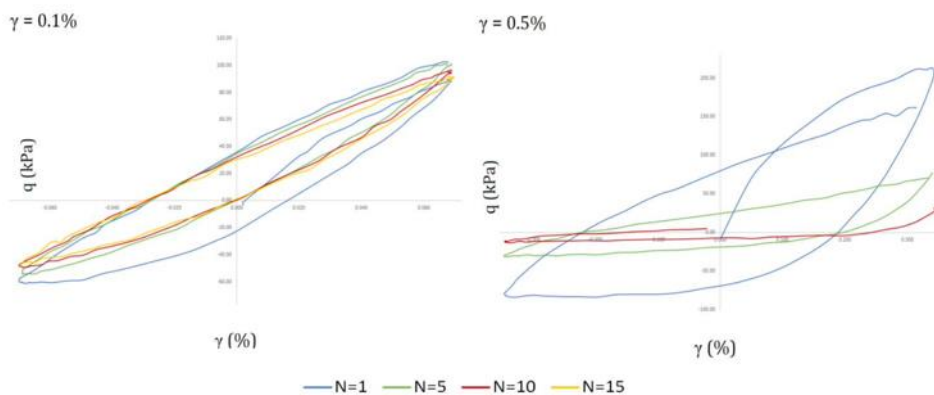
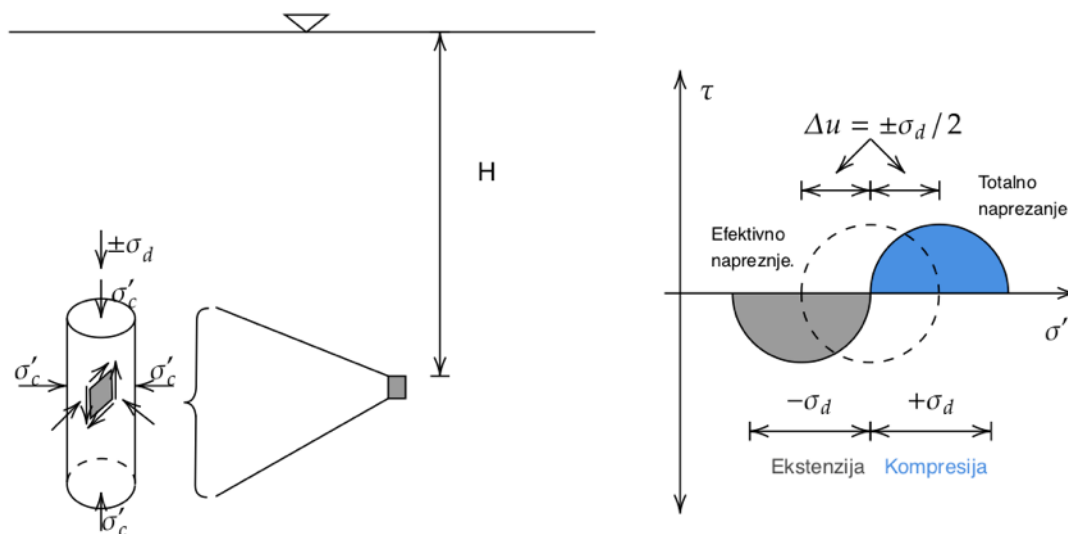


Test: Kao32; Soil: Kaolinite Clay; PI=28 (MH); e=1.23; w=46%
 σ'_{vc} =218 kPa; OCR=1; f=0.1 Hz



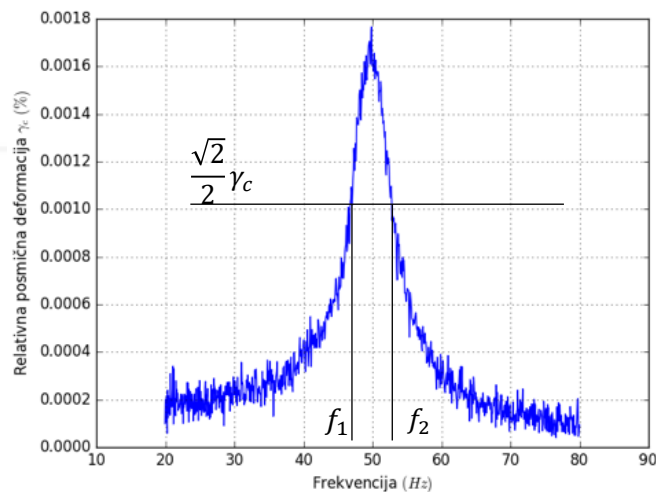
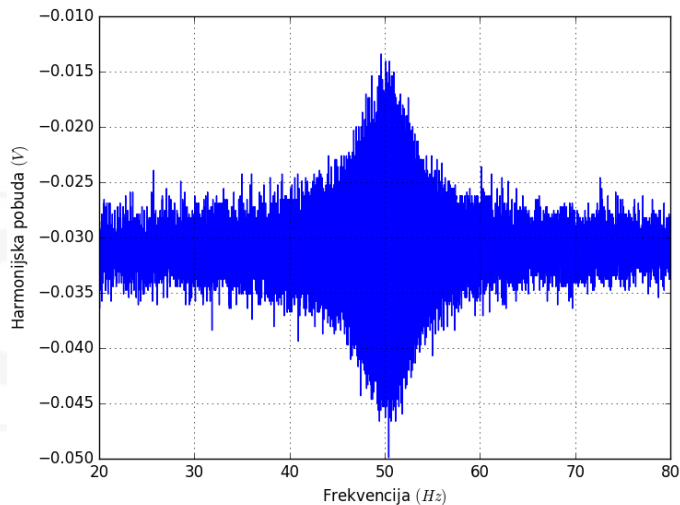
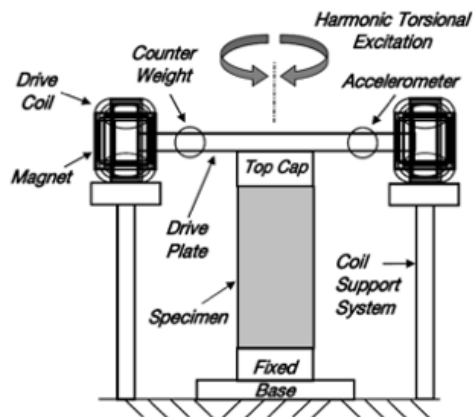
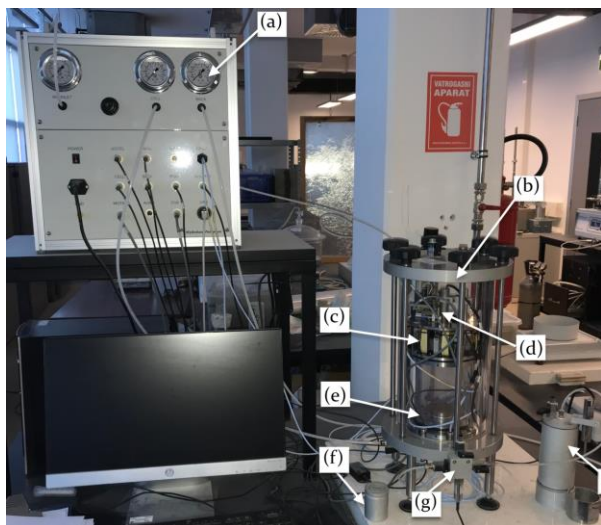
Mortezaie & Vucetic (2015)

Uređaj za troosno smicanje



Jagodnik (unpub)

Uređaj za rezonantni stupac/torzijsko smicanje

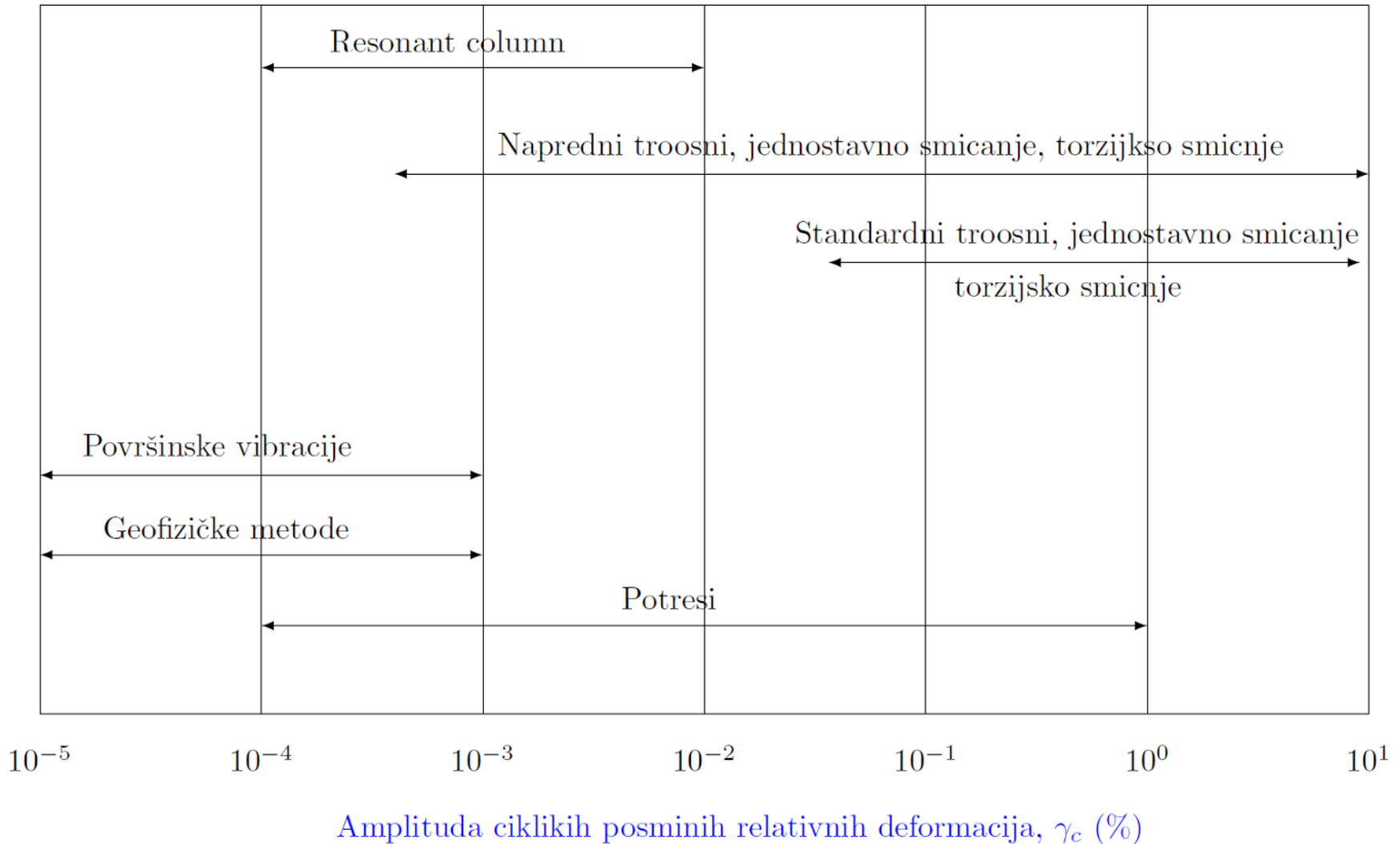


$$v_s = \frac{2 \cdot \pi \cdot f_r \cdot L}{F}$$

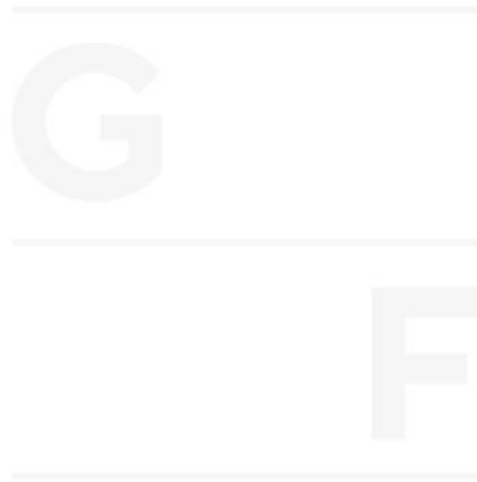
$$\lambda = \frac{f_2 - f_1}{2 \cdot f_r}$$

$$G = \rho \cdot v_s^2$$

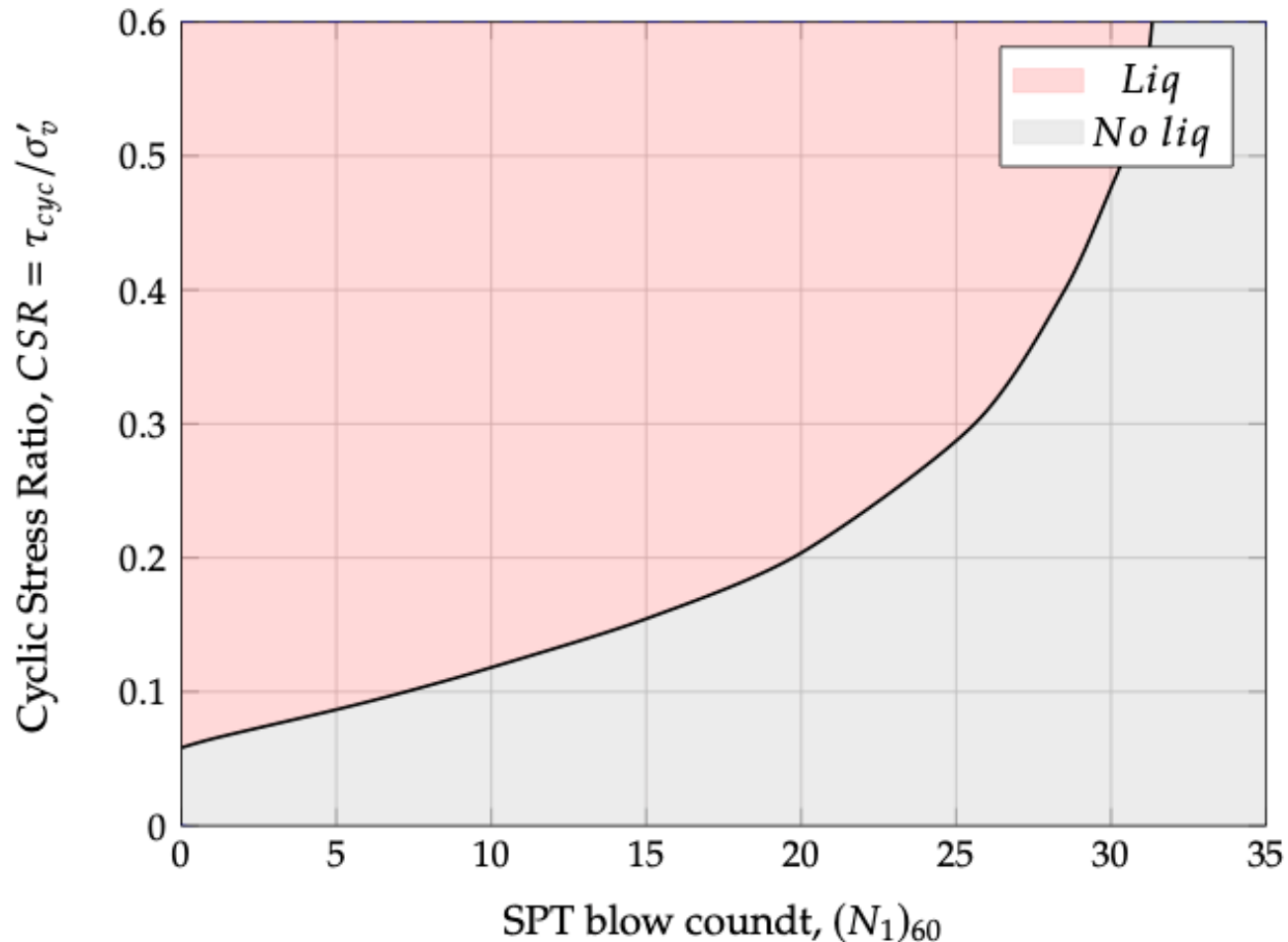
Kada koristiti koji uređaj?



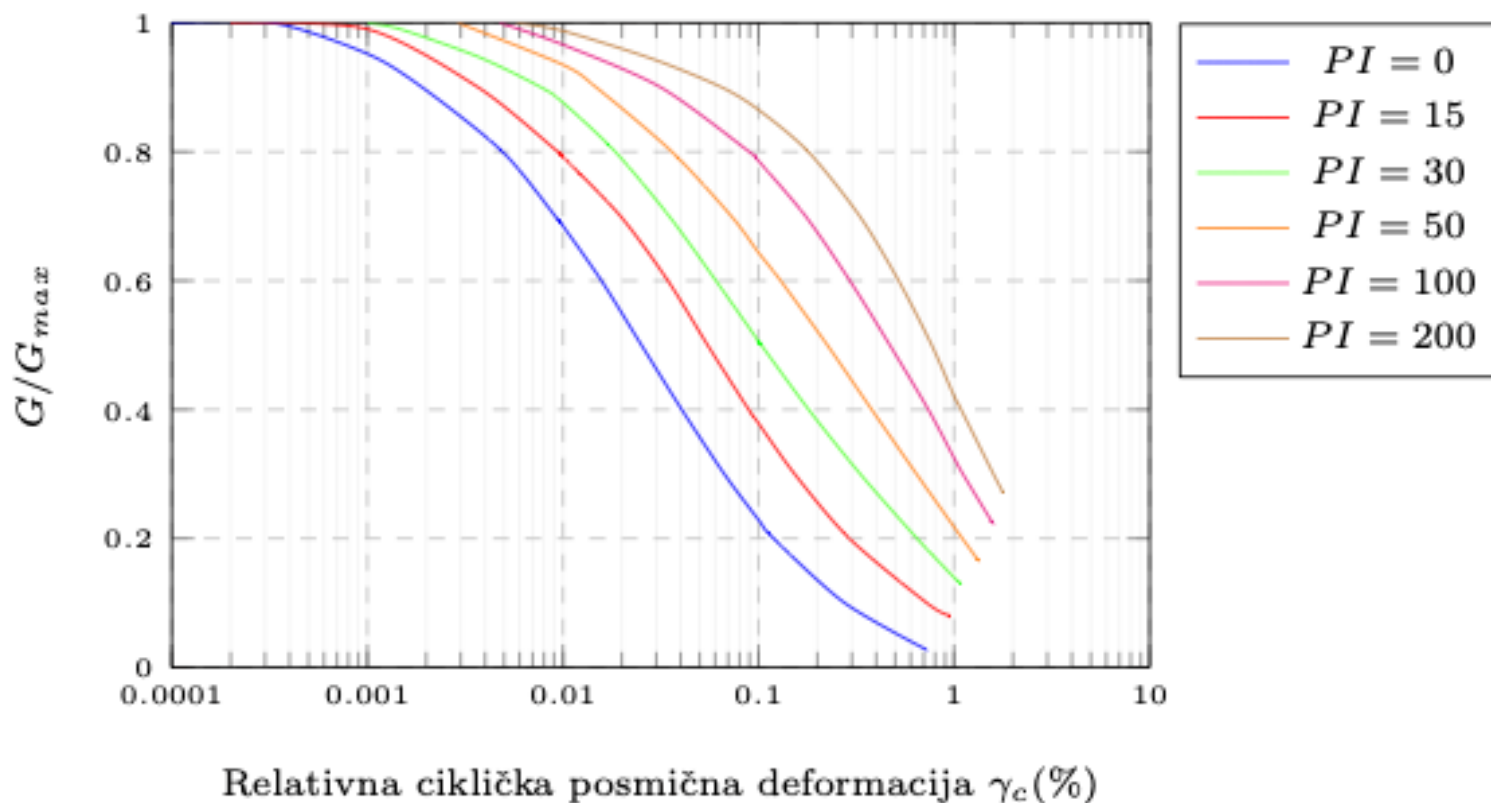
Karakteristični rezultati cikličkog djelovanja na tlo



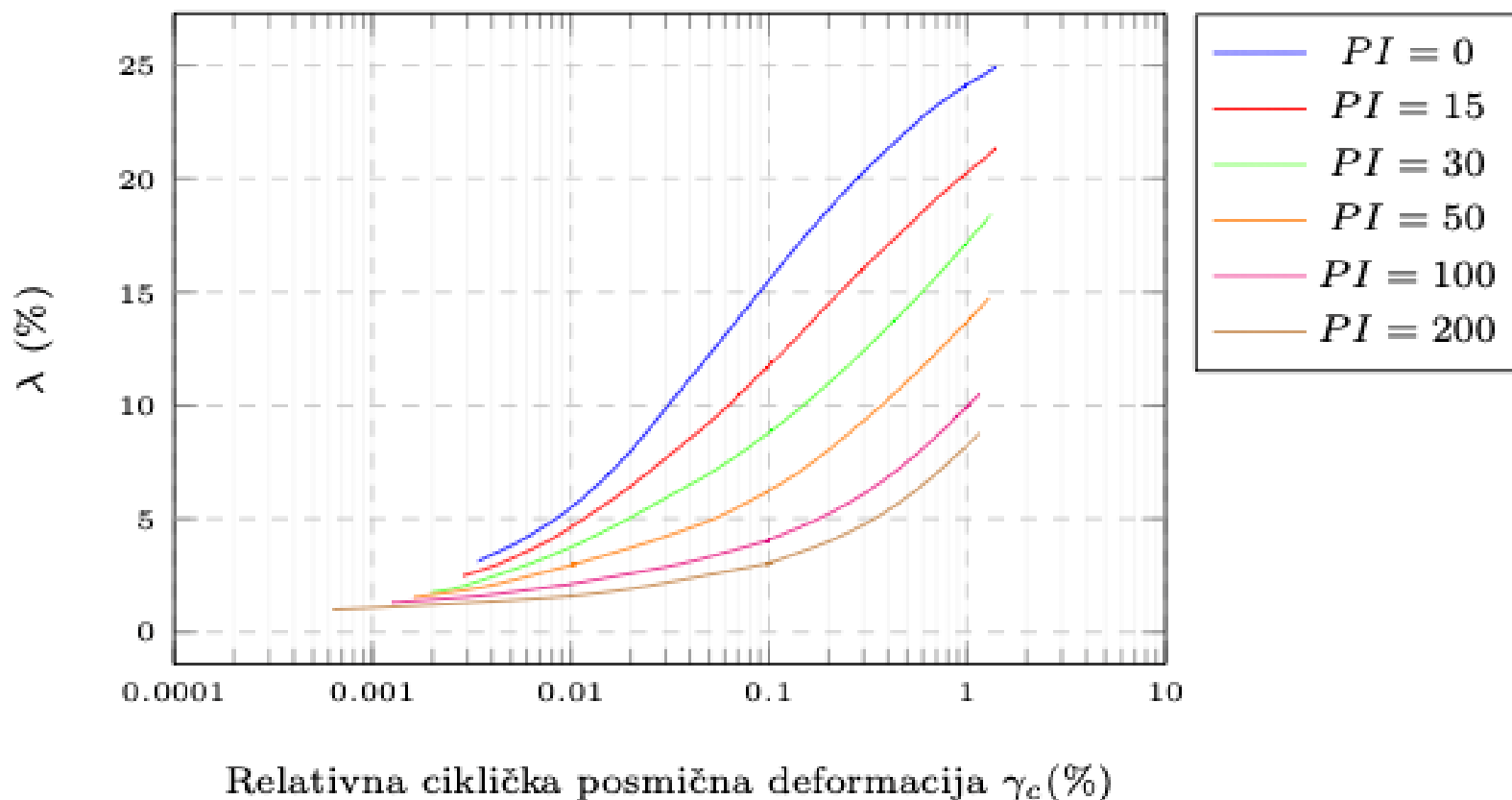
Procjena potencijala likvefakcije (DSS&TRIAX)



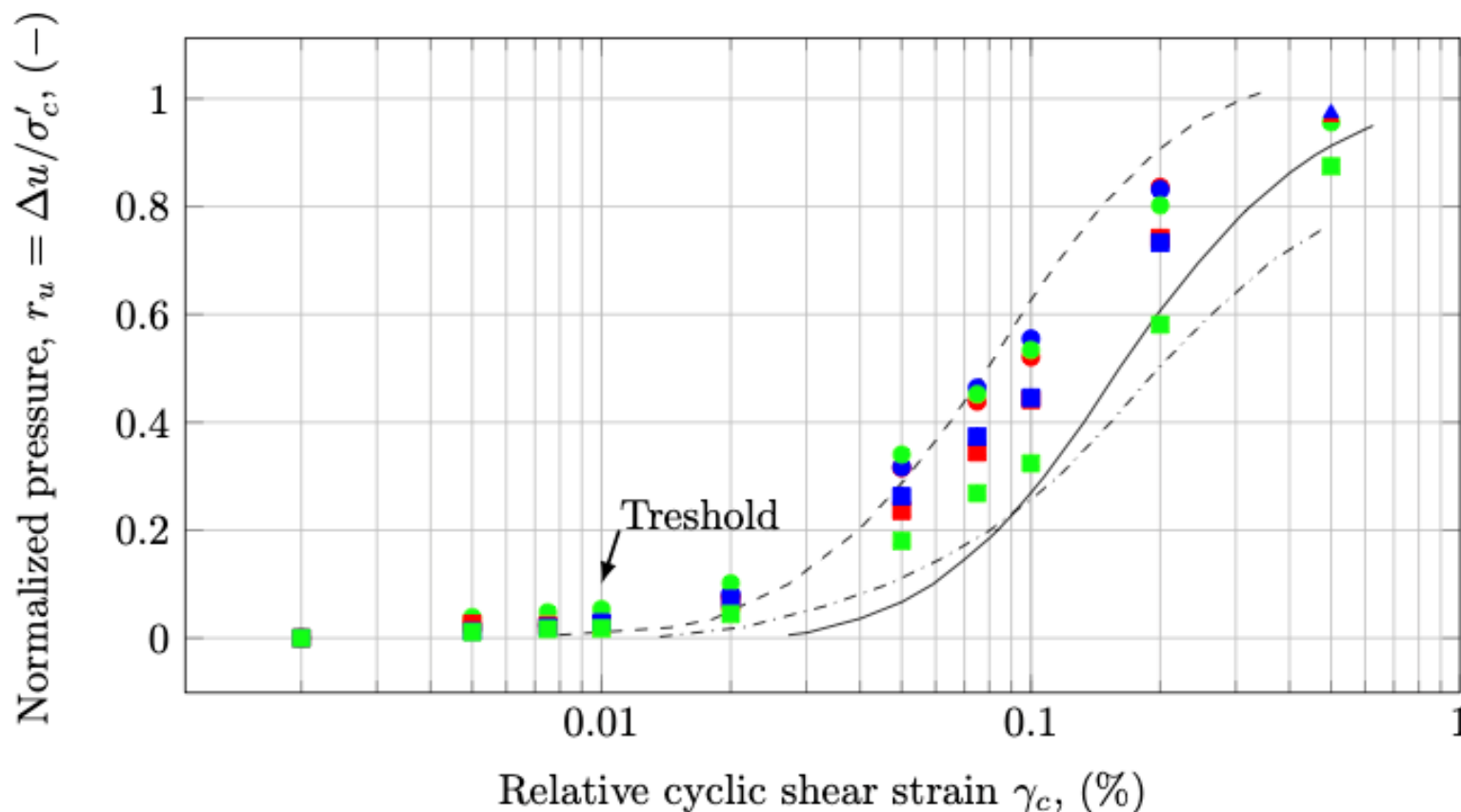
Procjena redukcije čvrstoće (DSS, TRIAX, RC)



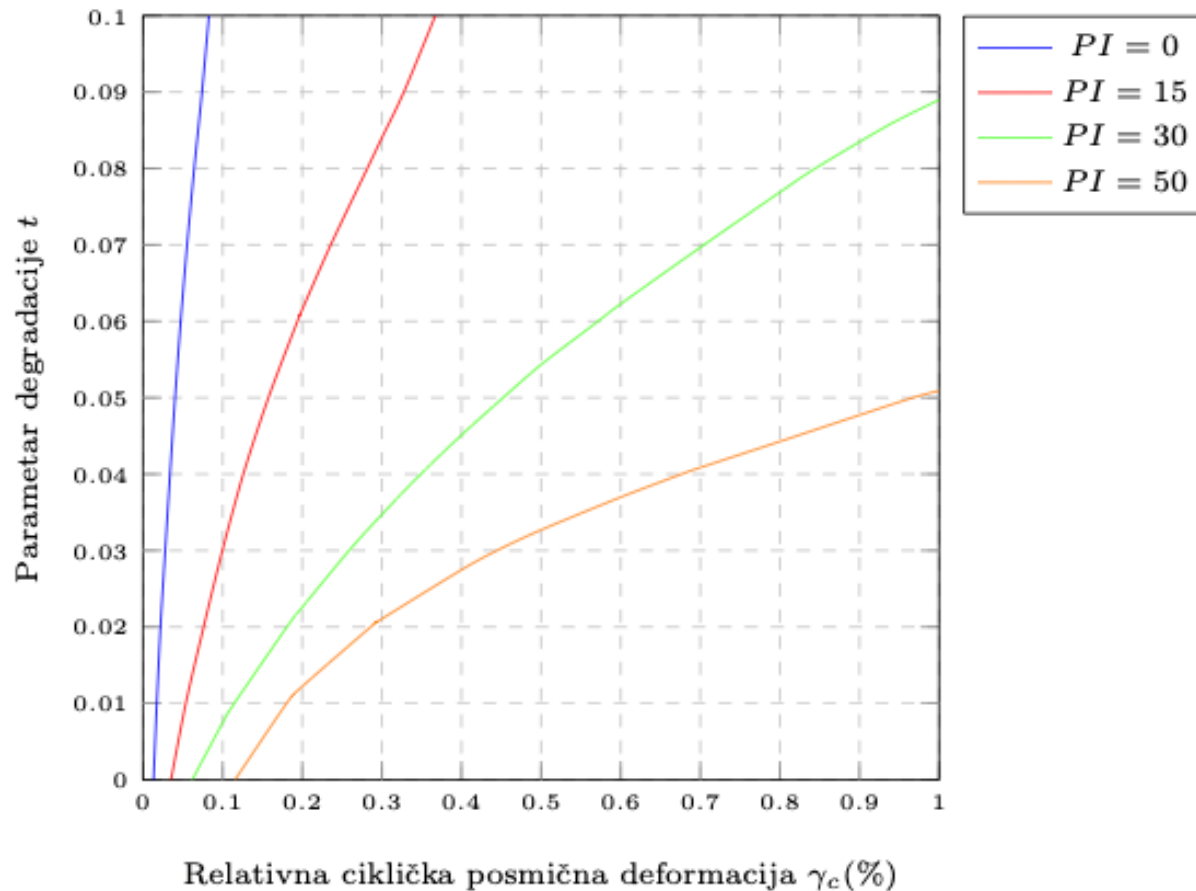
Procjena ekvivalentnog prigušenja (DSS, TRIAX, RC)



Procjena prirasta pornog pritiska (DSS, TRIAX, RC)



Procjena indeksa i parametra degradacije (DSS, TRIAX, RC)



Umjesto zaključka

