

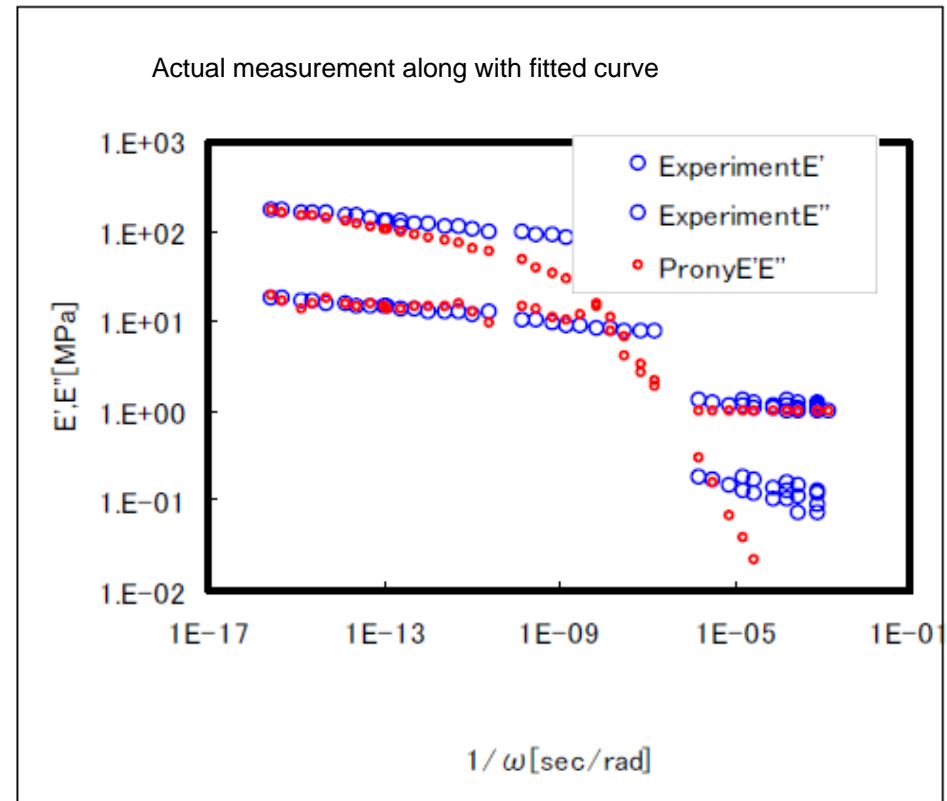
## θ8 Identification of material property

ANSYS 10.0

Young's Modulus[MPa]	Poisson's Ratio[-]
1.85935E+02	4.99000E-01
$\bar{g}_i^P$ [MPa]	$\tau_i^G$ [sec]
1.88935E-01	2.65258E-16
1.44650E-01	5.30516E-15
1.11418E-01	5.30516E-14
1.04720E-01	5.30516E-13
1.36631E-01	5.30516E-12
1.22598E-01	1.59155E-10
3.71703E-02	7.95775E-10
1.39394E-01	7.95775E-09
9.22053E-03	1.59155E-07
4.90074E-07	1.59155E-06
8.32058E-05	1.59155E-05
1.79160E-12	1.59155E-04

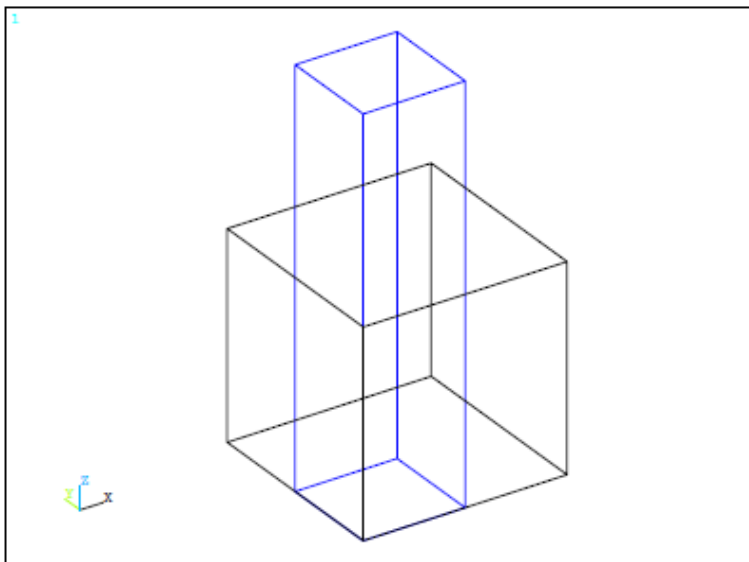
Prony series

$$G(\tau) = G_0 \left\{ 1 - \sum_{i=1}^N \bar{g}_i^P \left( 1 - e^{-\tau/\tau_i^G} \right) \right\}, \quad K(\tau) = \infty$$



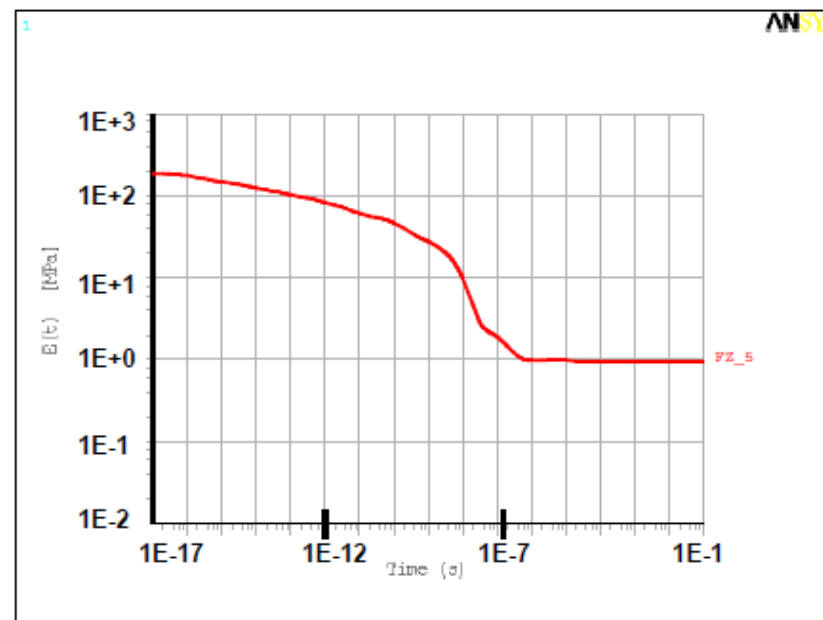
# $\theta$ 8 Stress-relaxation analysis : theta8\_relax\_ansys.dat

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Hexahedron (1mmx1mmx1mm)  
Keeping 1mm enforced displacement

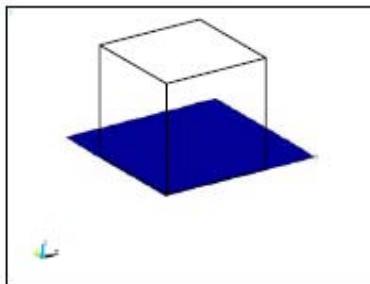
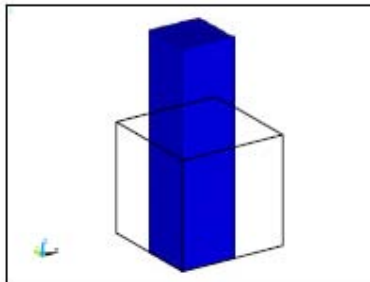
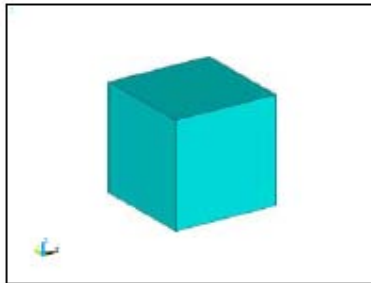
Analysis model



Stress-relaxation curve

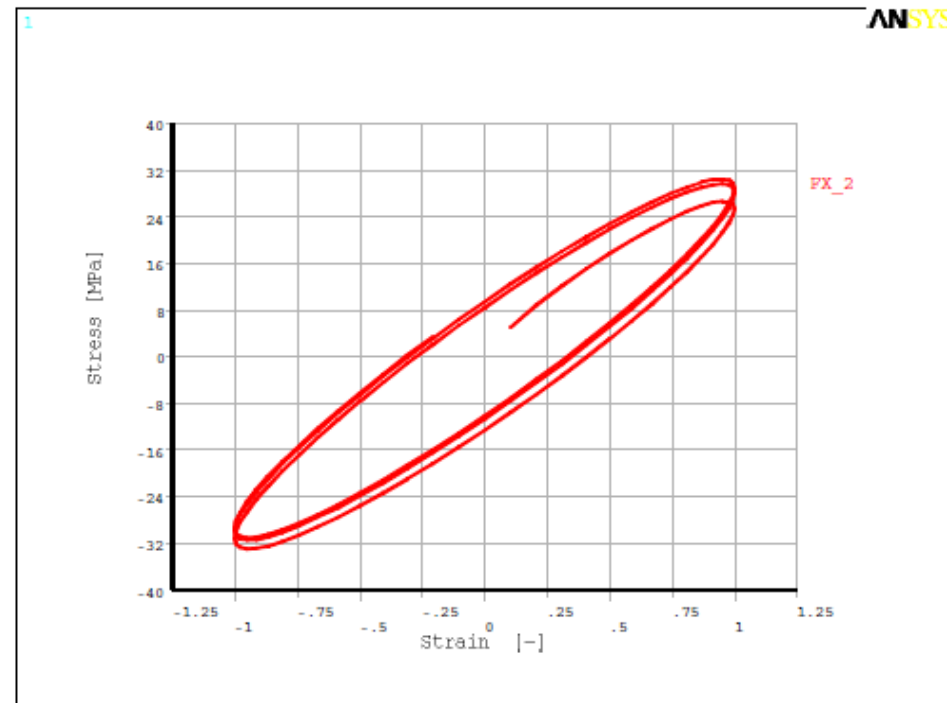
## θ8 Harmonic vibration analysis (theta8\_freq\_ansys.dat)

ANSYS 10.0



Analysis model

Amplitude  $A = 1\text{mm}$   
 Frequency  $f = 10^8\text{Hz}$   
 Displacement  $\delta = A \sin 2\pi f t$



**$10^8\text{Hz}$  hysteresis curve**