ON QUASILINEAR VISCOELASTIC CONSTITUTIVE EQUATIONS

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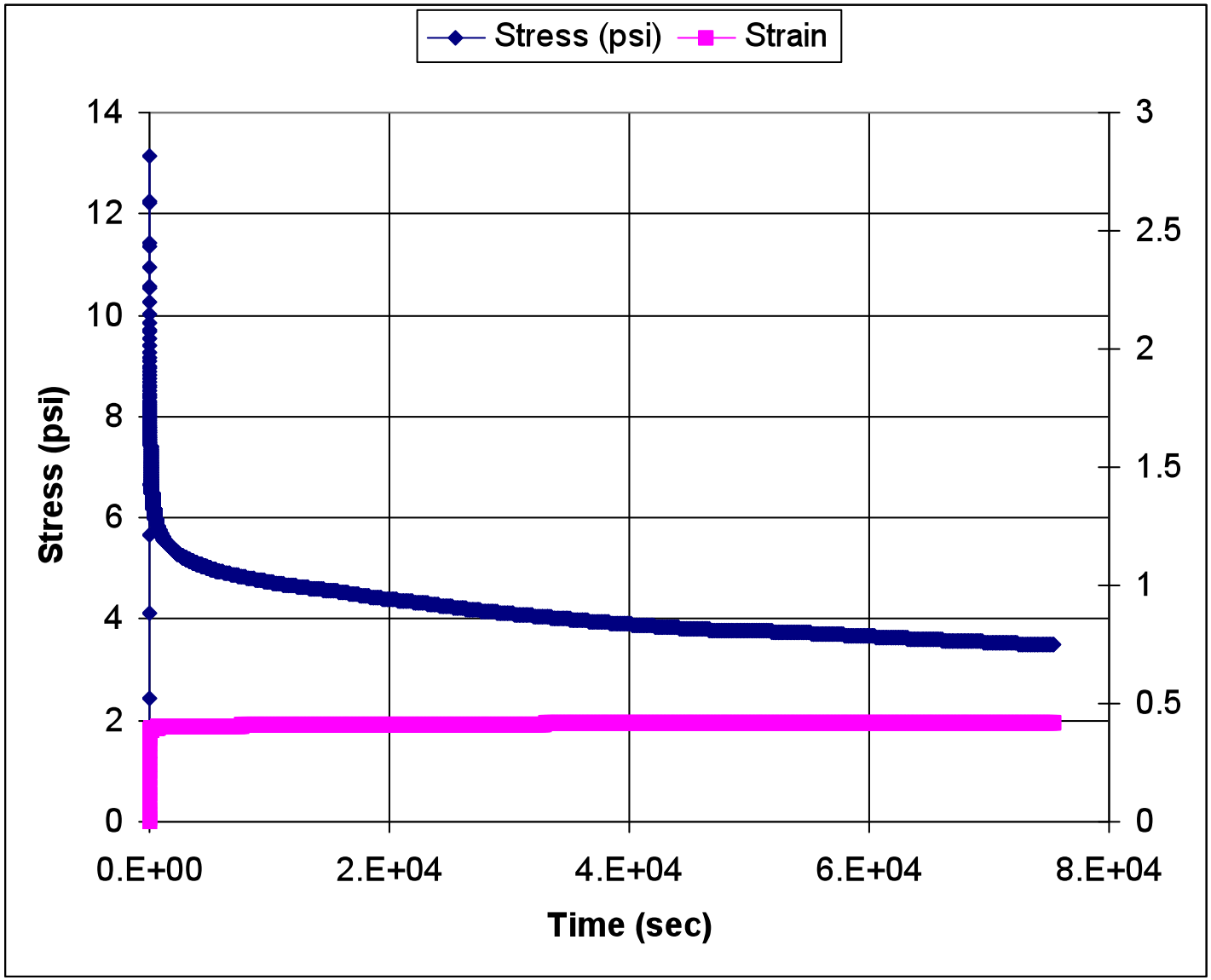
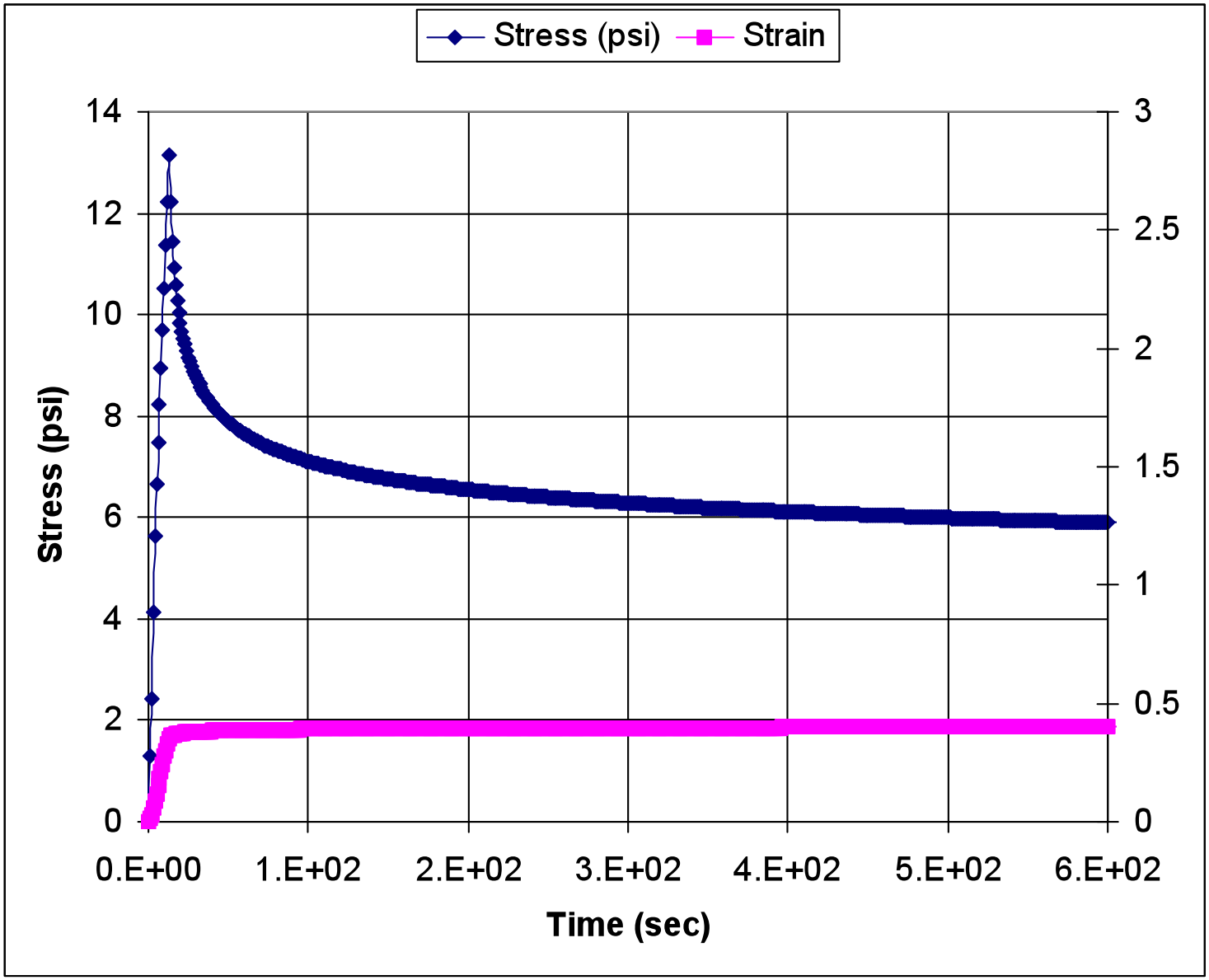
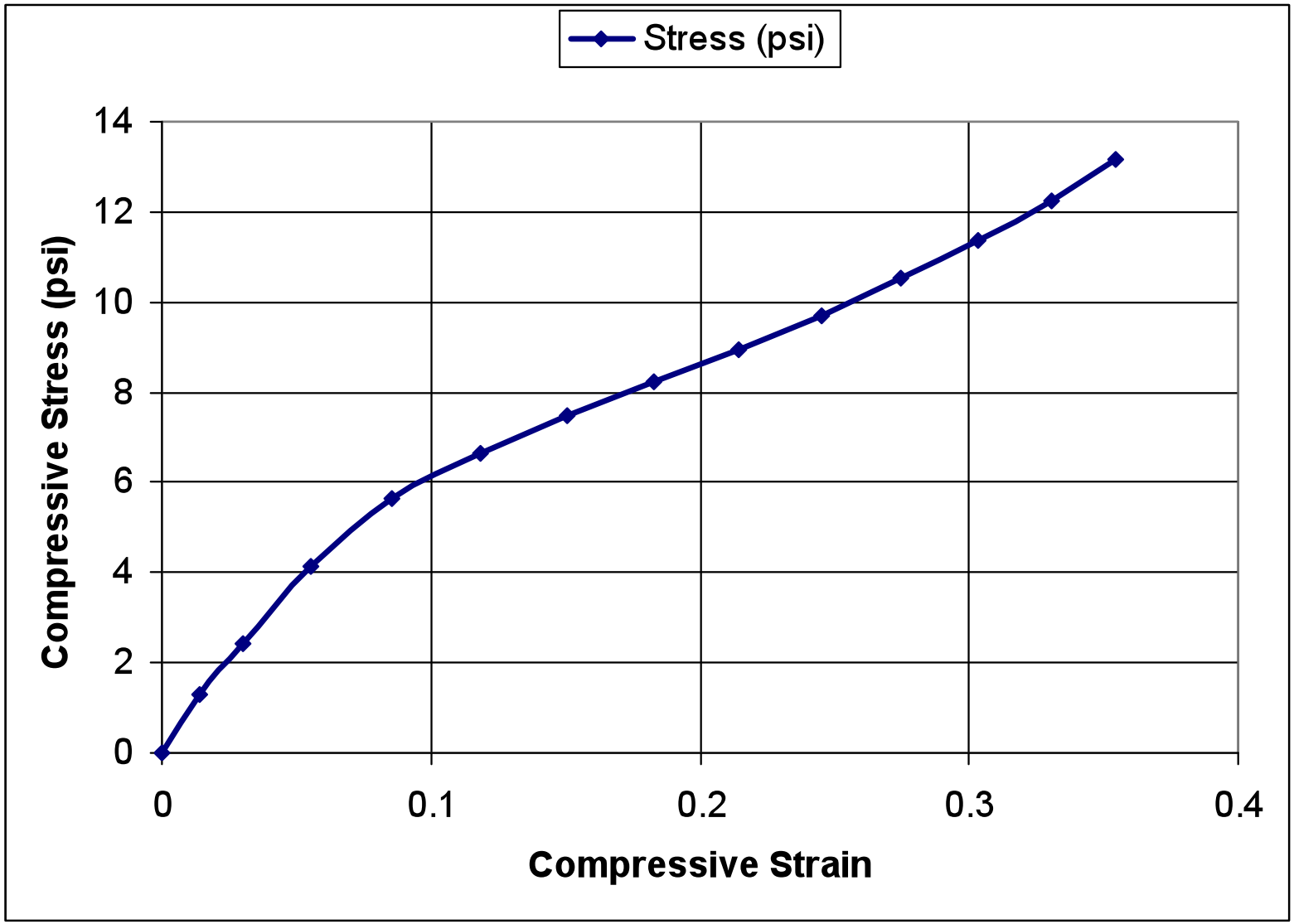
Experimental relaxation data



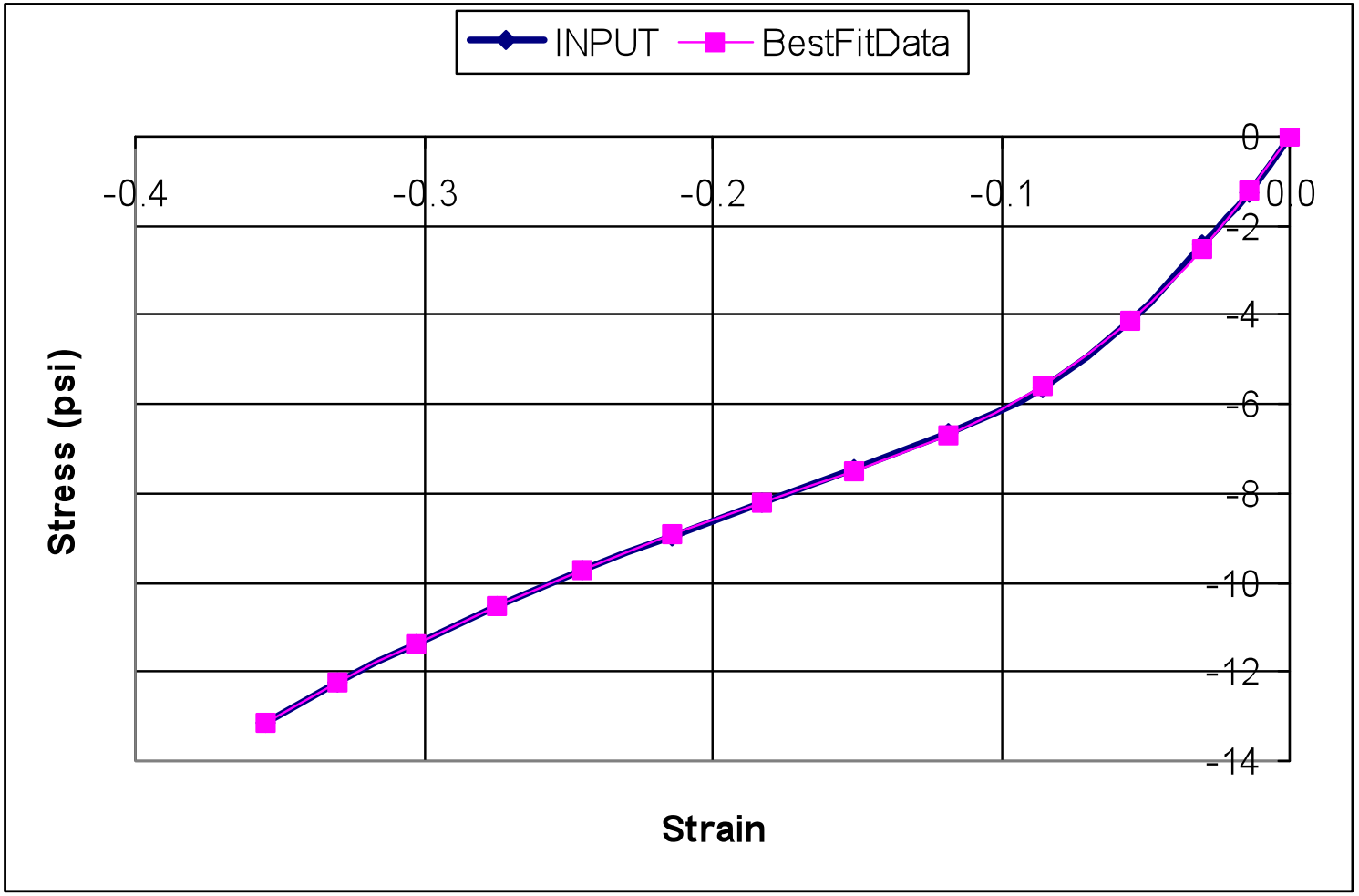
Experimental relaxation data



Stress-strain curve



Material constants for the stress-strain curve



$C1 = 0.91E+02 \quad C2 = 0.23E+03 \quad C3 = -0.19E+04$

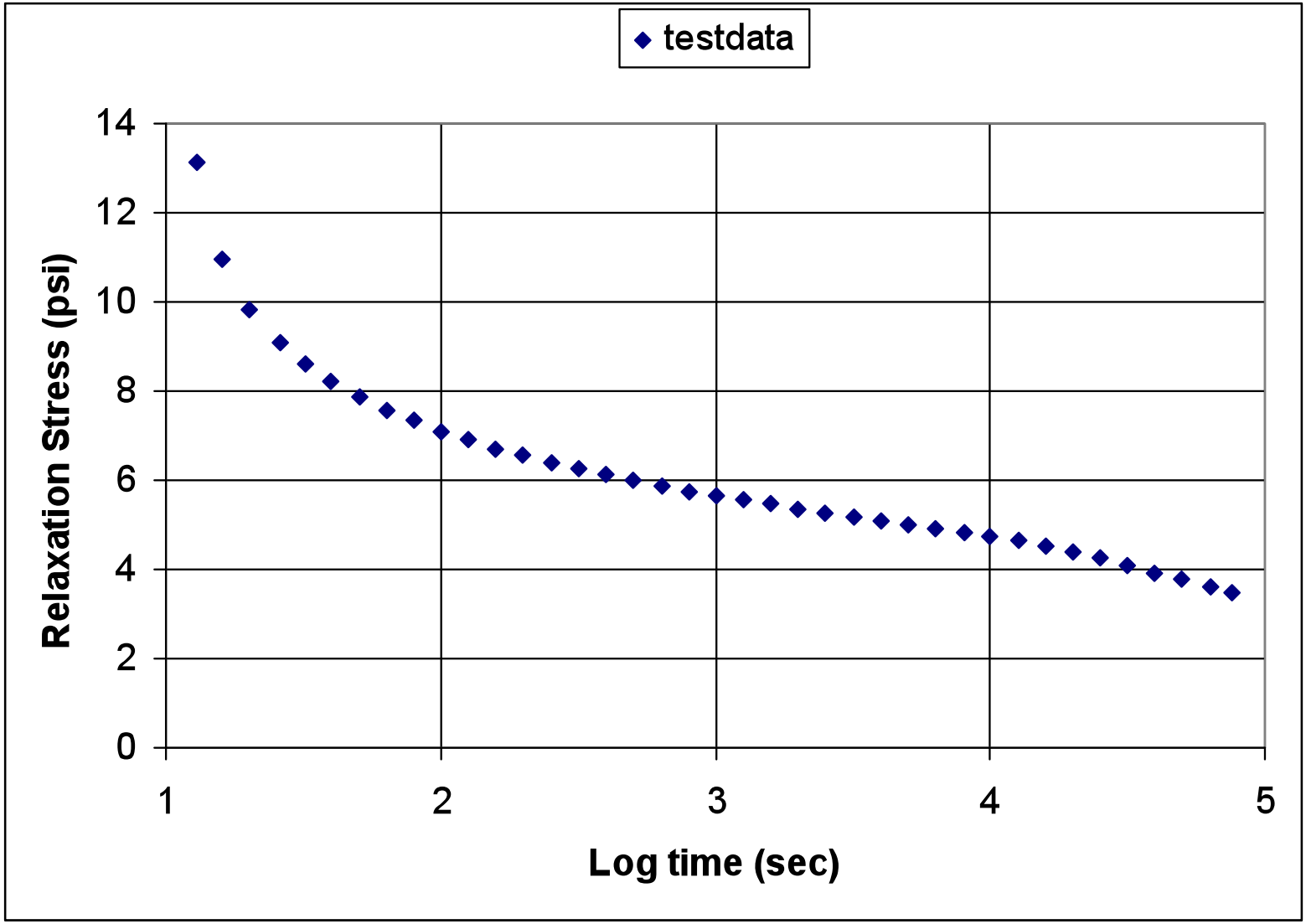
$C4 = -0.17E+05 \quad C5 = -0.45E+05 \quad C6 = -0.42E+05$

Since the relaxation is performed at a strain –0.355 and the measured stress is -13.1457; hence, all C's for LS-DYNA must be divided by 13.1457. Or:

C1 = 0.692E+01 C2 = 0.175E+02 C3 = -0.144E+03
C4 = -0.129E+04 C5 = -0.342E+04 C6 = -0.319E+04

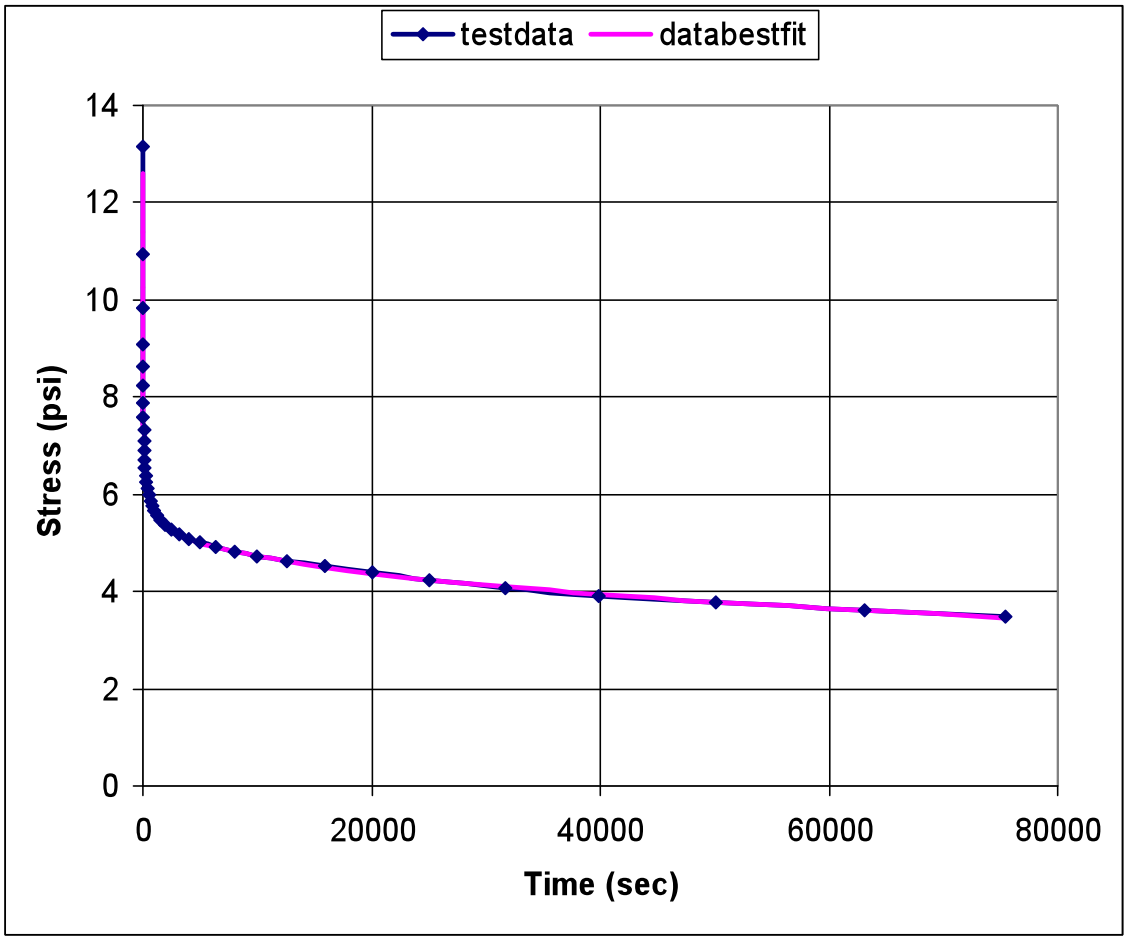
Semi-log plot of the experimental relaxation data

Selected experimental relaxation data used in the analysis



Comparison between constitutive equation and test data (35.5% strain)

I	*G(I)*	*BETA(I)*
0	*0.2313E+01*	*0.0000E+00*
1	*0.2423E+01*	*0.1000E-04*
2	*0.6103E+00*	*0.1000E-03*
3	*0.1167E+01*	*0.1000E-02*
4	*0.1939E+01*	*0.1000E-01*
5	*0.1613E+02*	*0.1000E+00*



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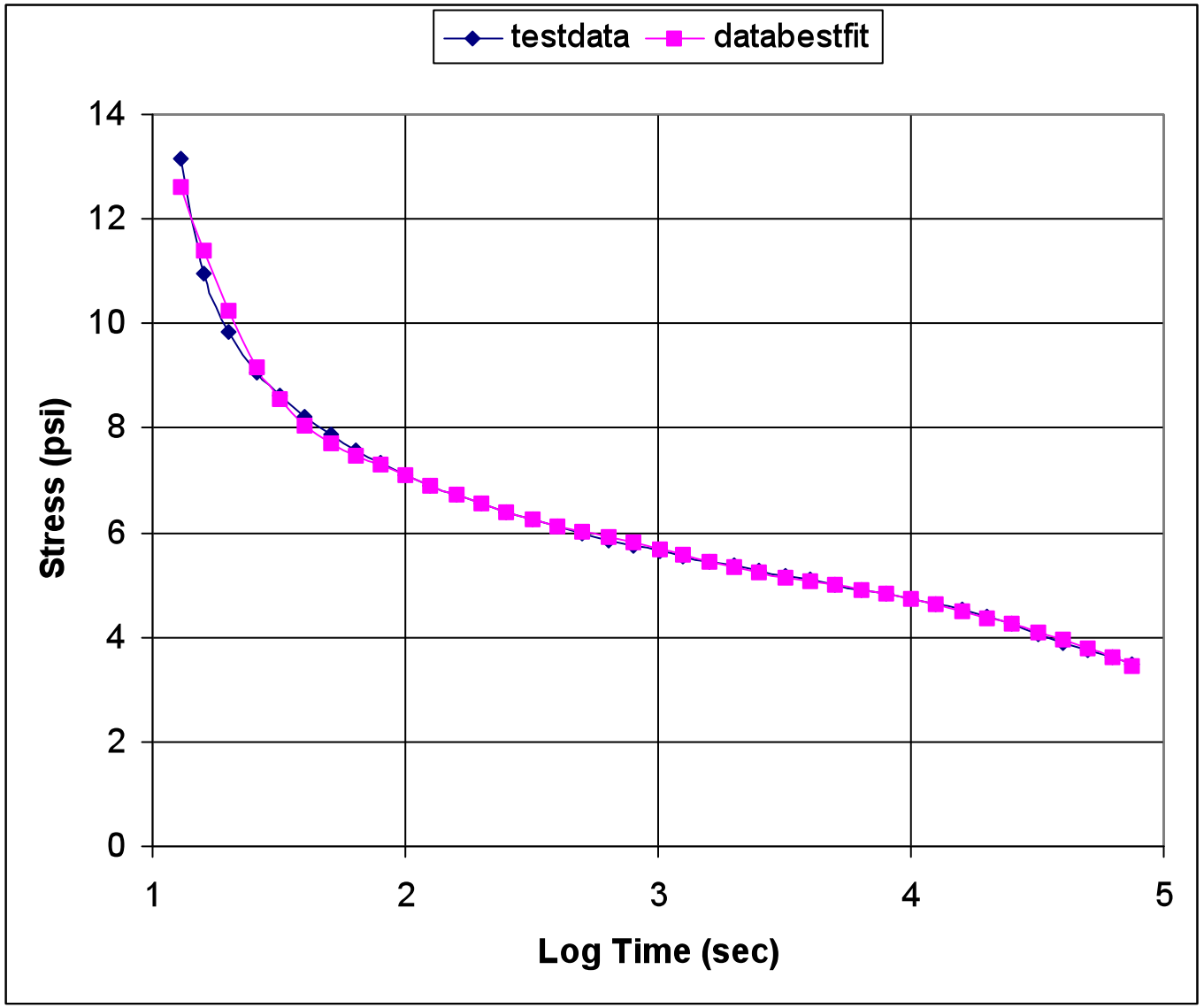

All G's must be divided by 0.355 and 2*(1+nu) for LS-DYNA input.

I	*G(I)*	*BETA(I)*
0	*6.515E+00*	*0.0000E+00*
1	*6.825E+01*	*0.1000E-04*
2	*1.7192E+00*	*0.1000E-03*
3	*32873E+00*	*0.1000E-02*
4	*5.4620E+00*	*0.1000E-01*
5	*4.5437E+01*	*0.1000E+00*

Material constants for LS-DYNA

C1 = 0.692E+01 C2 = 0.175E+02 C3 = -0.144E+03

C4 = -0.129E+04 C5 = -0.342E+04 C6 = -0.319E+04

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5	*4.5437E+01*	*0.1000E+00*