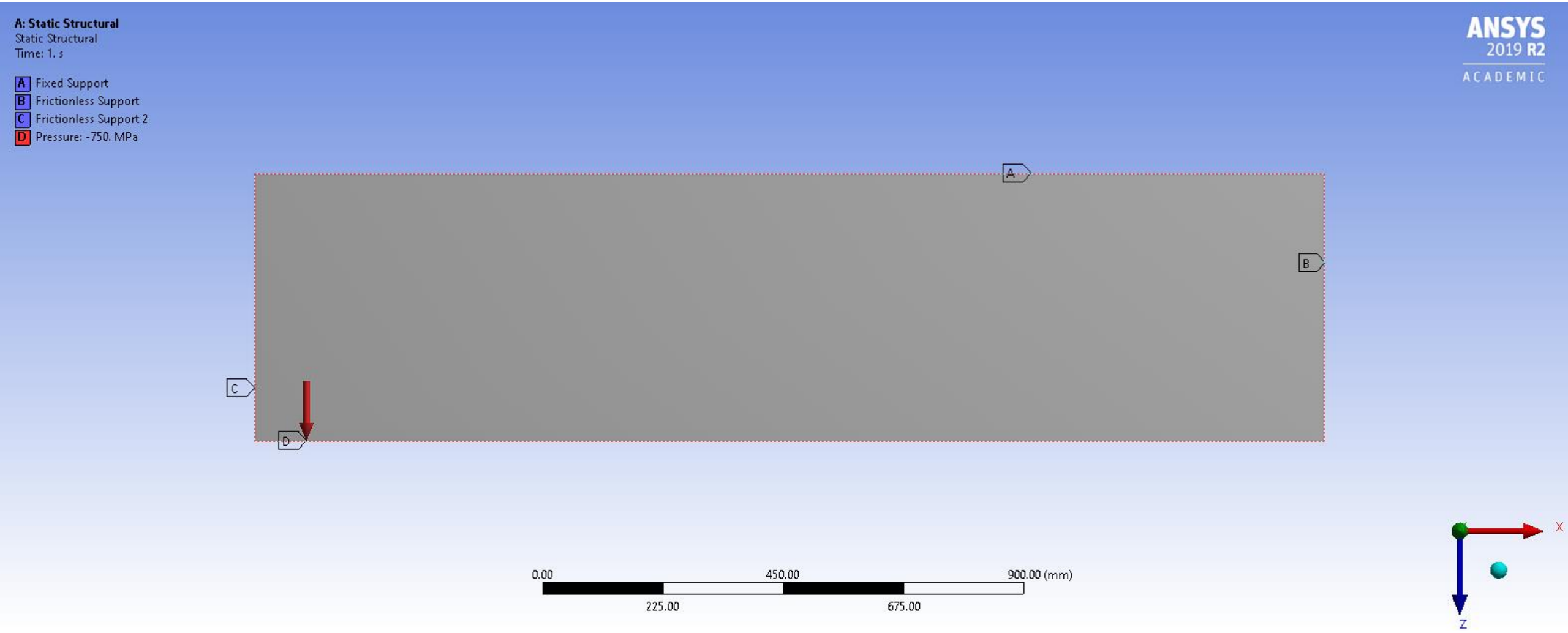
MKC517E – Special Topics in Solid Mechanics

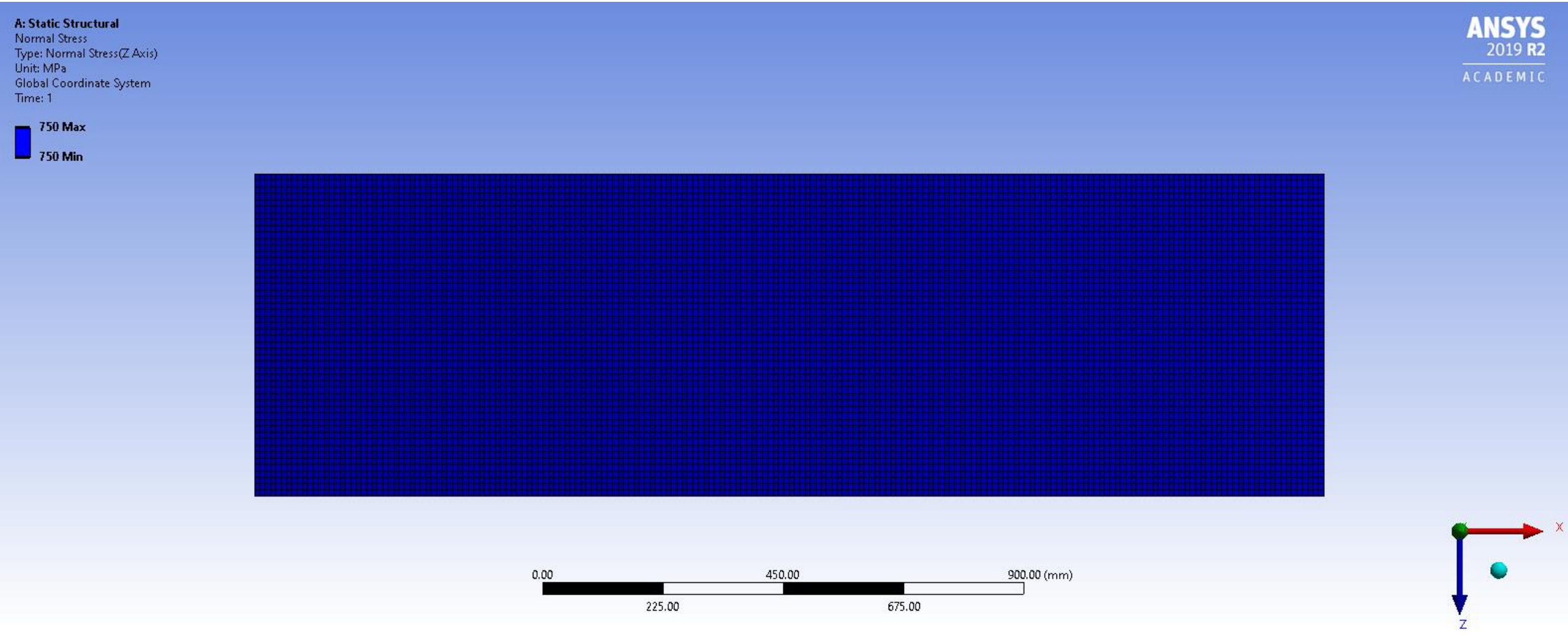
Homework 4

Erdem Çalışkan/503191531

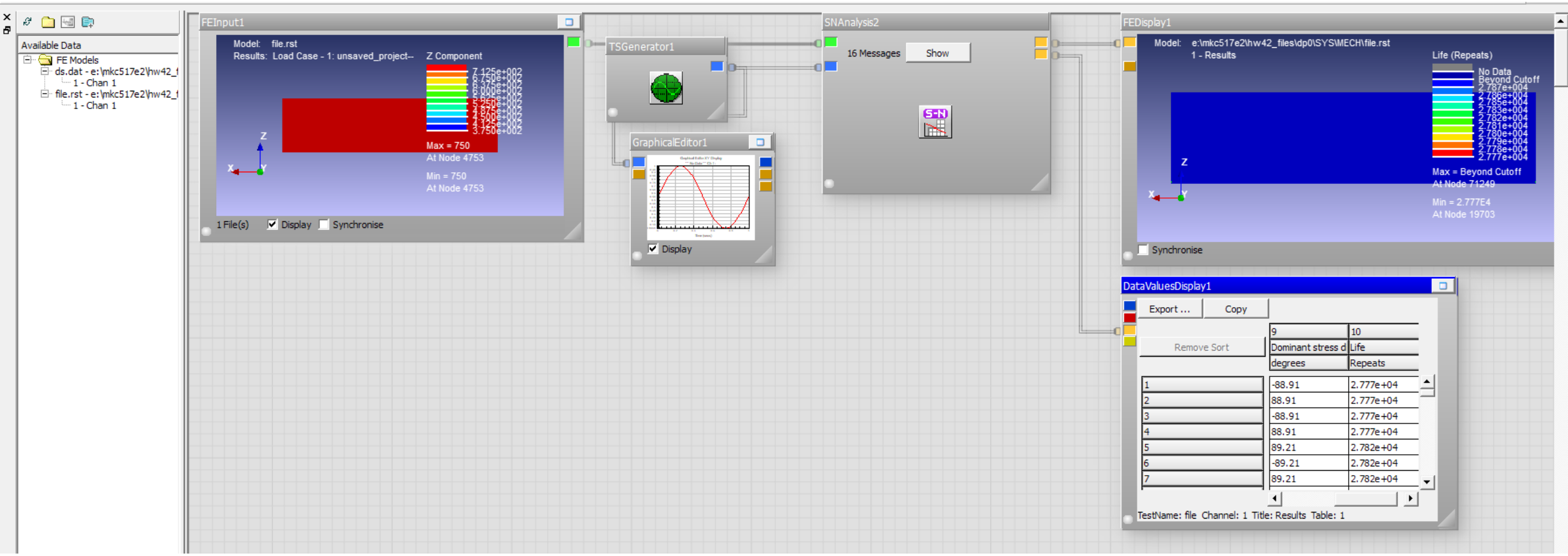
Boundary conditions for FEM Analysis



Normal Stress Result

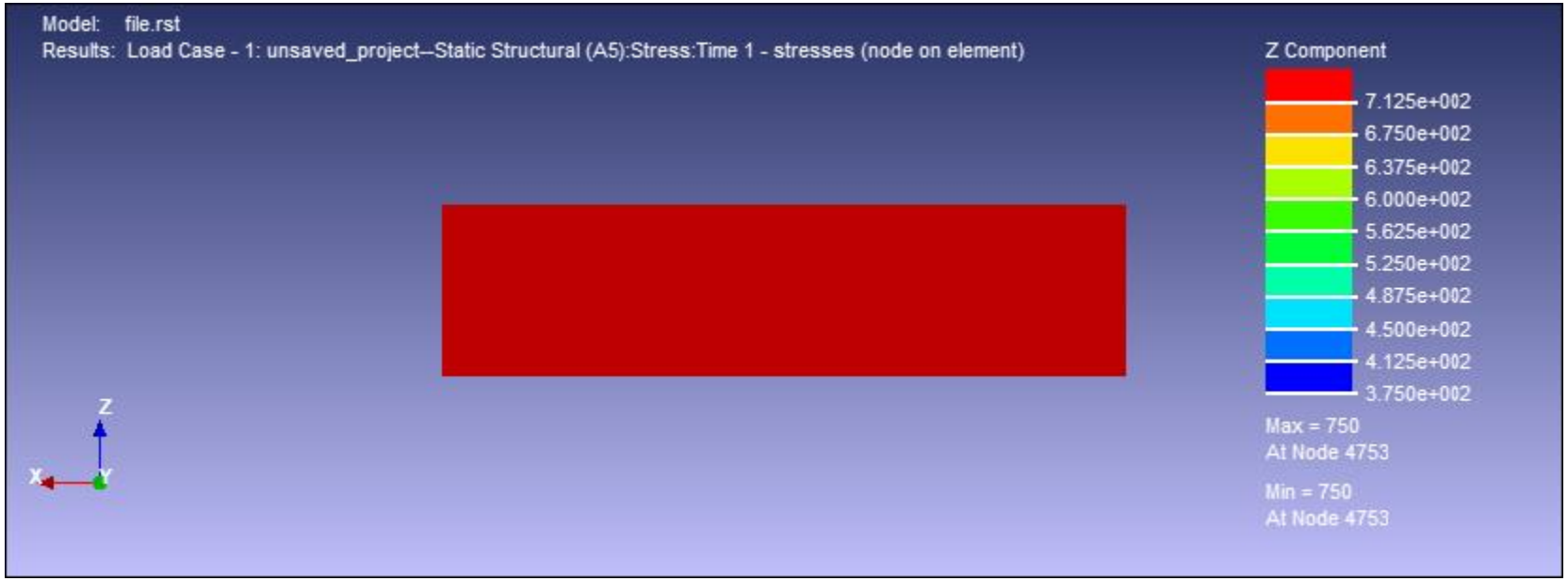


nCode Workspace



FEM Input in nCode

- z component is used for stress.



Material data

Material Dataset Properties

Material Dataset Name: Steel_UML_UTS1000

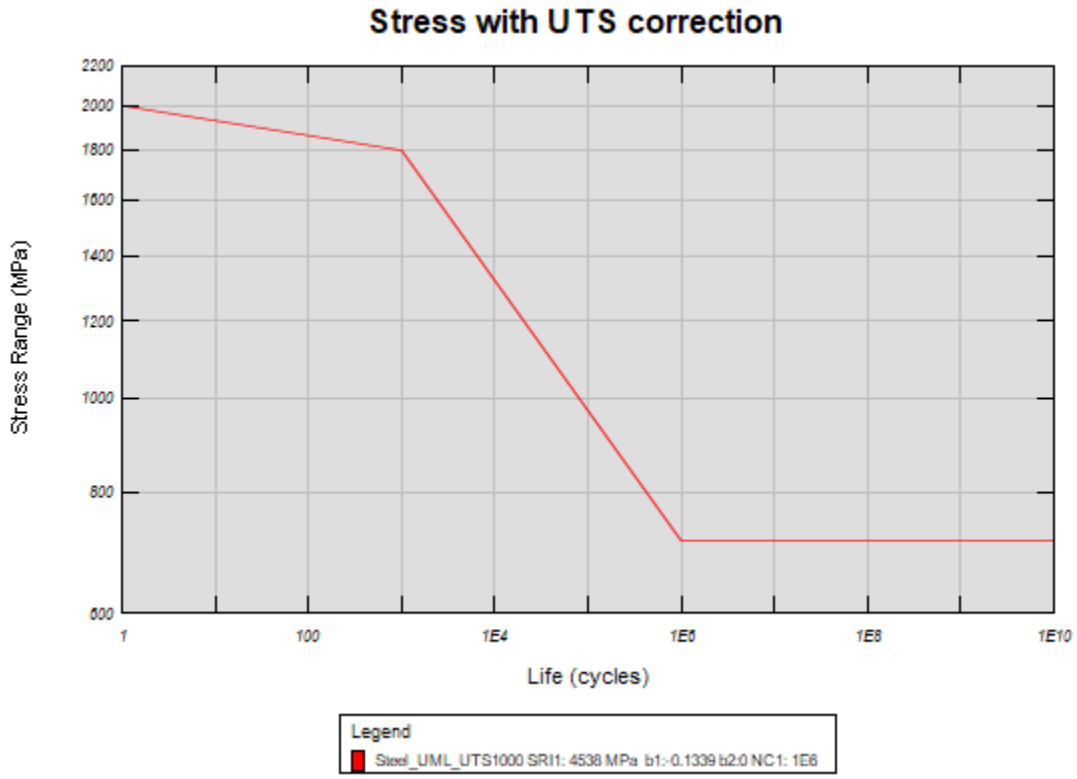
Dataset Type: nCodeSNMatData Display Child Data

Properties | Graph

	Steel_UML_UTS1000	Description
MaterialType	99	Material Type
YS	769.231	Yield Strength (MPa)
UTS	1000	Ultimate Tensile Strength (MPa)
E	2.1E5	Elastic Modulus (MPa)
me		Elastic Poisson's Ratio
mp		Plastic Poisson's Ratio
SRI1	4538	Stress Range Intercept (MPa)
b1	-0.1339	First Fatigue Strength Exponent
Nc1	1E6	Fatigue Transition Point (cycles)
b2	0	Second Fatigue Strength Exponent
SE	0.1	Standard Error of Log(N)
RR	-1	R-ratio of Test
Nfc	1E30	Fatigue CutOff
M1		Mean stress parameter M1
M2		Mean stress parameter M2
M3		Mean stress parameter M3
M4		Mean stress parameter M4
Comments	Data generated from Uniform Material Law.	Comments
References	nCode Book of Fatigue Theory.	References

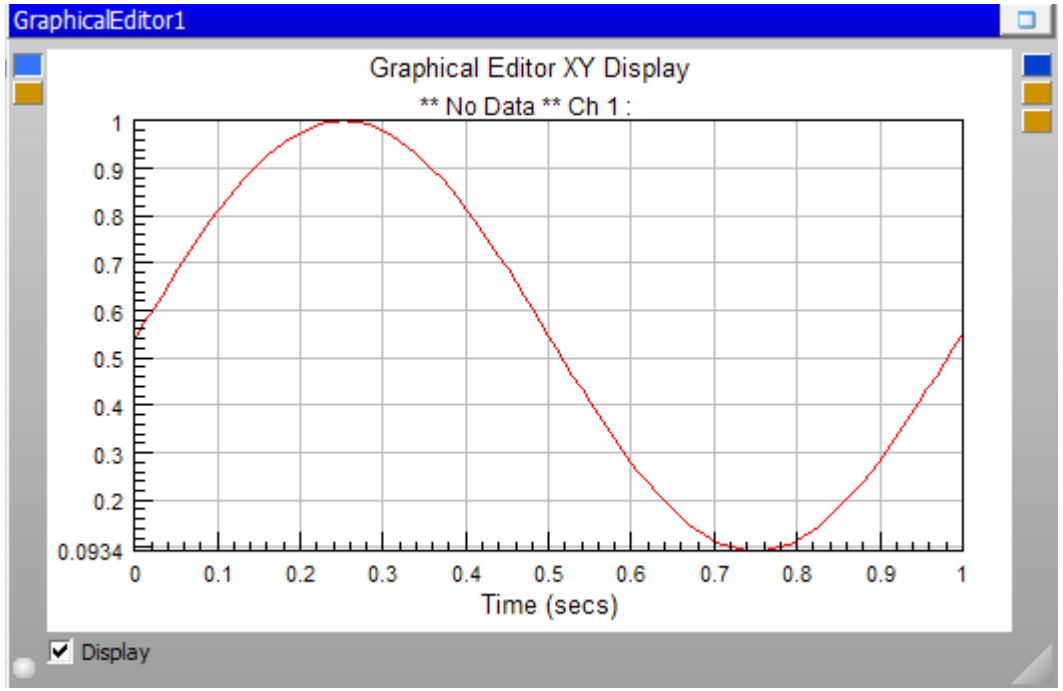
Close Help

- Steel with 1000 MPa UTS in the material database is used for calculations



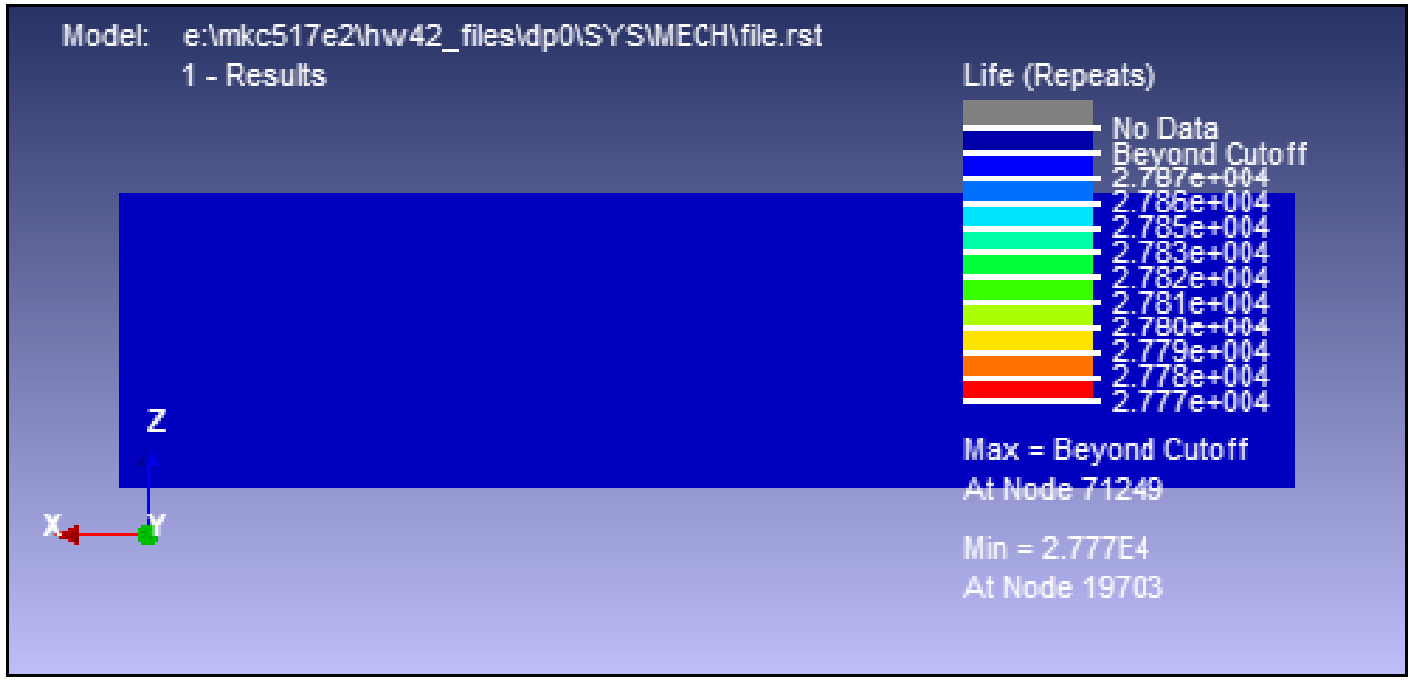
Load Mapping

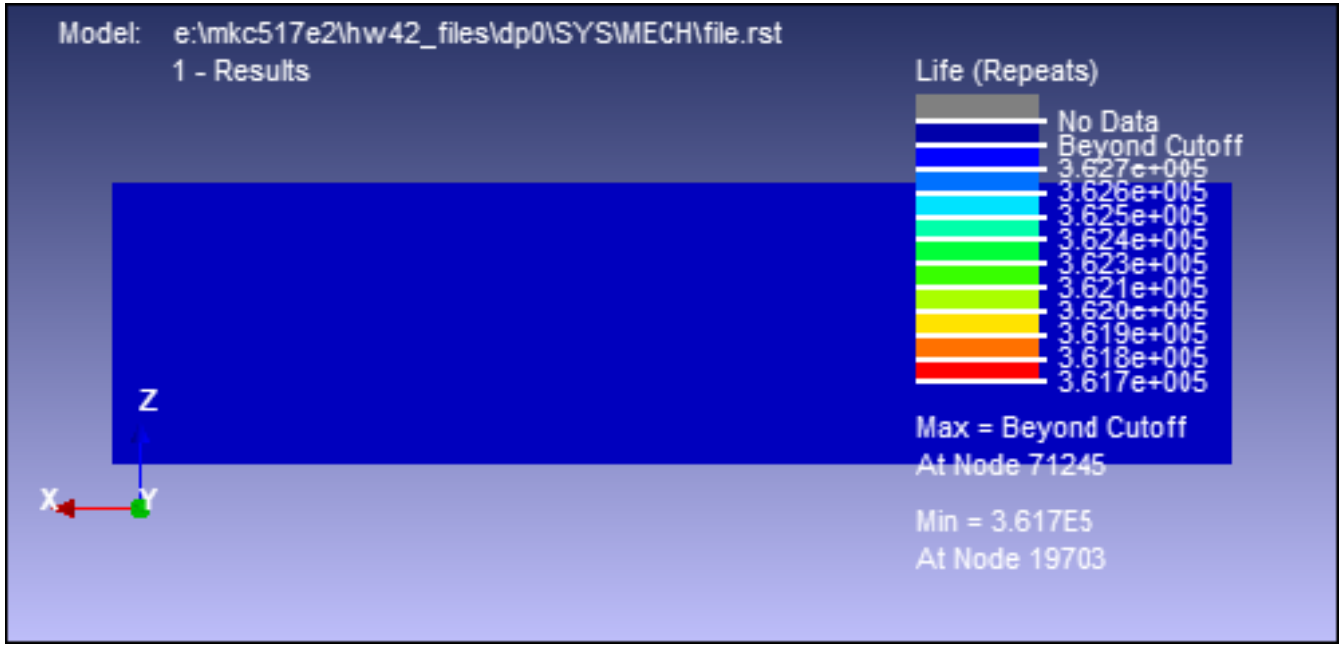
- Time series is generated with time series generator in nCode.
- Data is scaled as given in example.



Results for Goodman method

- Result: 27770 Cycle



Results for Gerber method

- Result: 361700 Cycle, approximately 1/3 of the life found by example