Verification of OpenSeespy Models with SeismoStruct

OpenSeespy is much more advantageous in terms of computational effort comparted to the other software such as SeismoStruct. Moreover, it has capability to perform parallel computing which I am still exploring. I have validated my model generator with other software as well. It seems that the results are accurate and there is no problem. The comparison provided more interesting results such as computational time. It seems that OpenSeespy is much more superior event with use of only single processor.

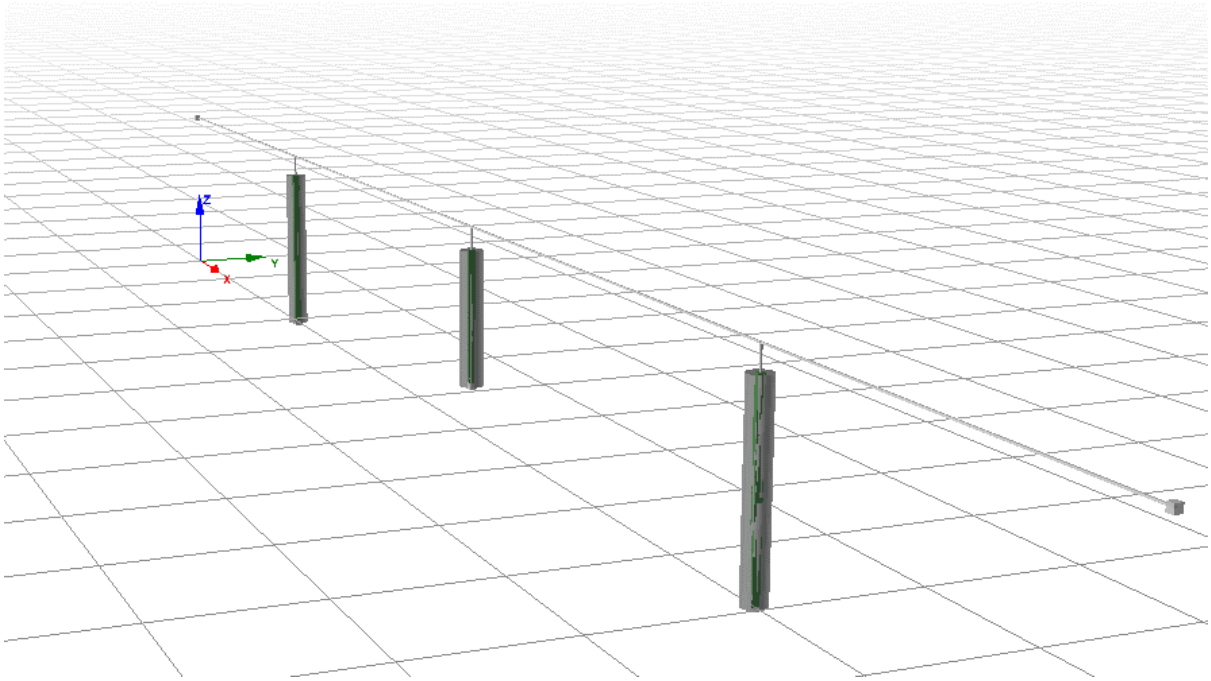


Figure 1. Example Bridge Model (SeismoStruct)

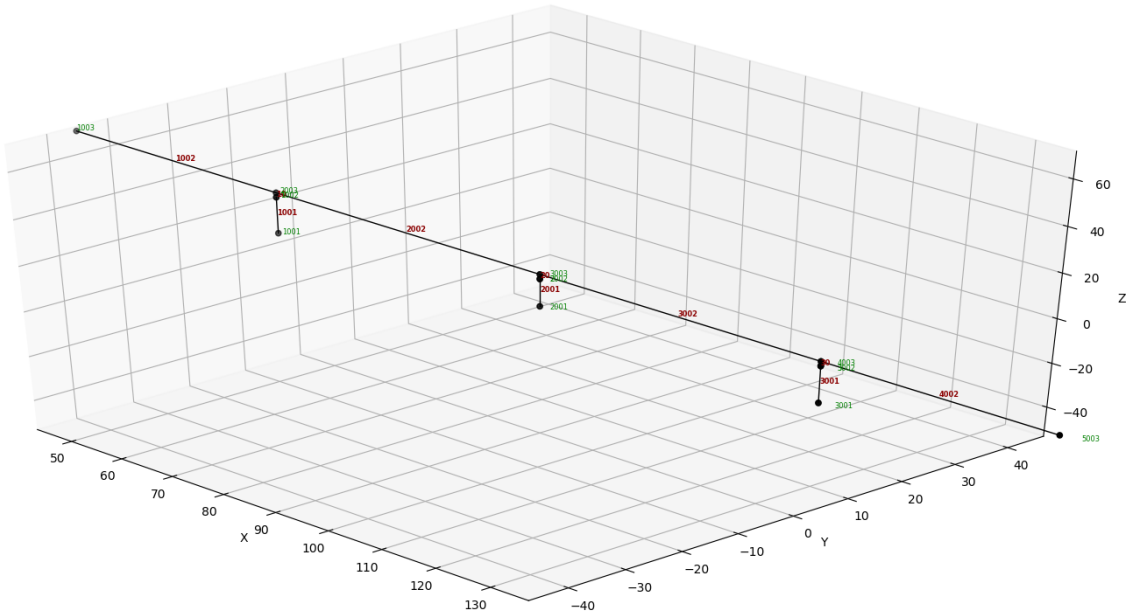


Figure 2. Example Bridge Model (OpenSeespy)

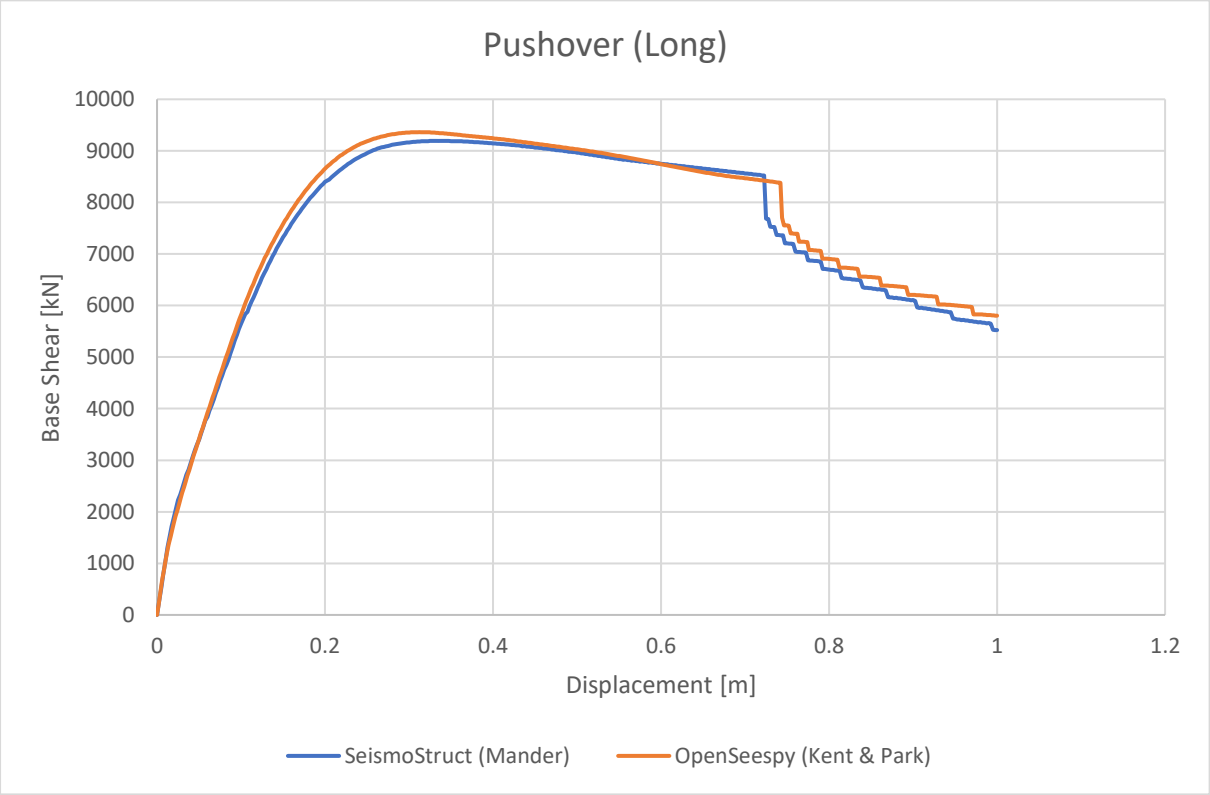
Results of gravity analysis:

Base Reaction	OpenSees	SeismoStruct
Pier 1	11041.14	11041.63
Pier 2	10831.61	10831.12
Pier 3	11041.14	11041.63
Abut 1	2933.43	2933.20
Abut 2	2933.43	2933.20
Total	38780.75	38780.76

Results of Pushover Analysis in Longitudinal Direction

SeismoStruct, Analysis time: 0 hours: 0 minutes: 35 seconds

OpenSeespy, Analysis time: 0 hours: 0 minutes: 1.37 seconds



Eigen Value Analysis

OpenSeesPy

Mode	T [sec]	f [Hz]	ω [rad/sec]
1	1.174	0.852	5.35
2	0.684	1.462	9.19
3	0.4	2.498	15.7
4	0.284	3.518	22.1
5	0.109	9.192	57.76

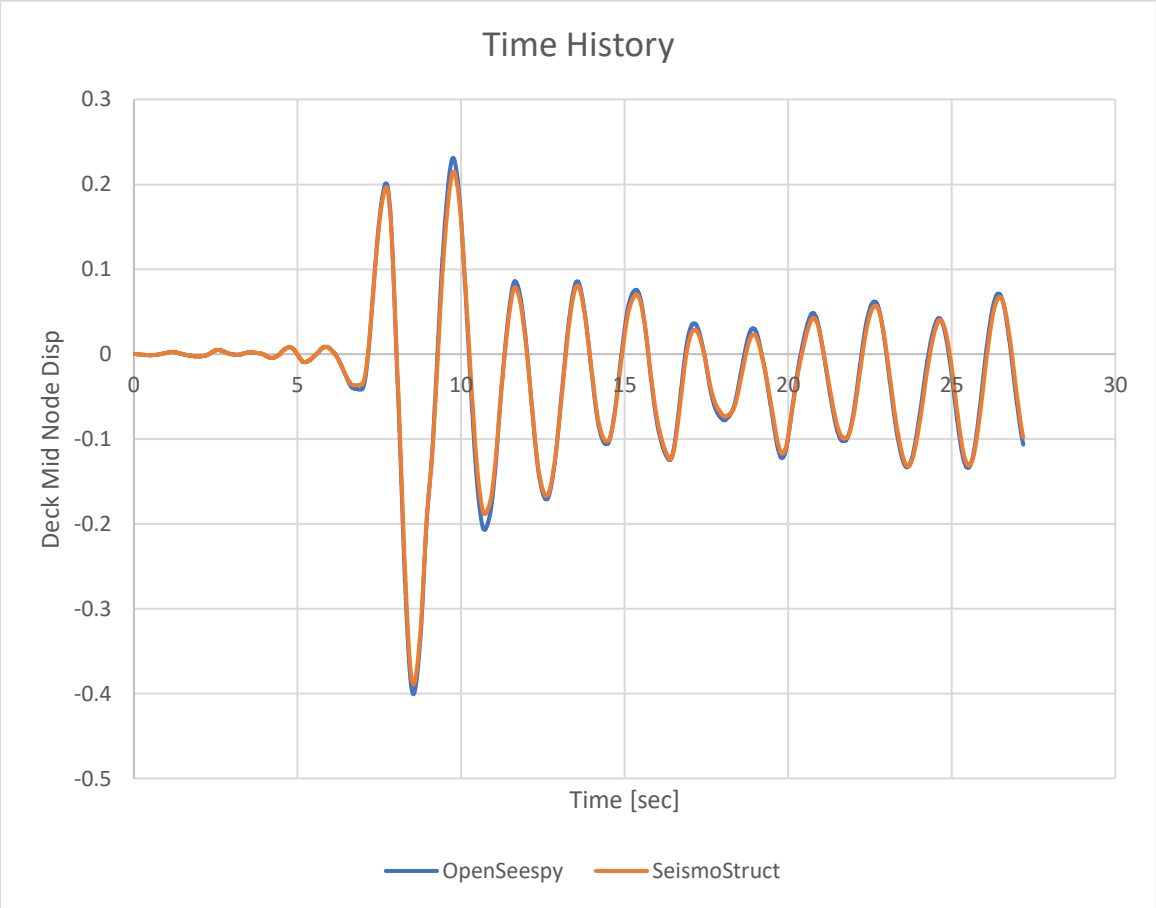
SeismoStruct

Mode	Period (sec)	Frequency (Hertz)	Angular Frequency (rad/sec)
1	1.174	0.852	5.354
2	0.684	1.463	9.190
3	0.400	2.500	15.710
4	0.284	3.521	22.125
5	0.109	9.192	57.756

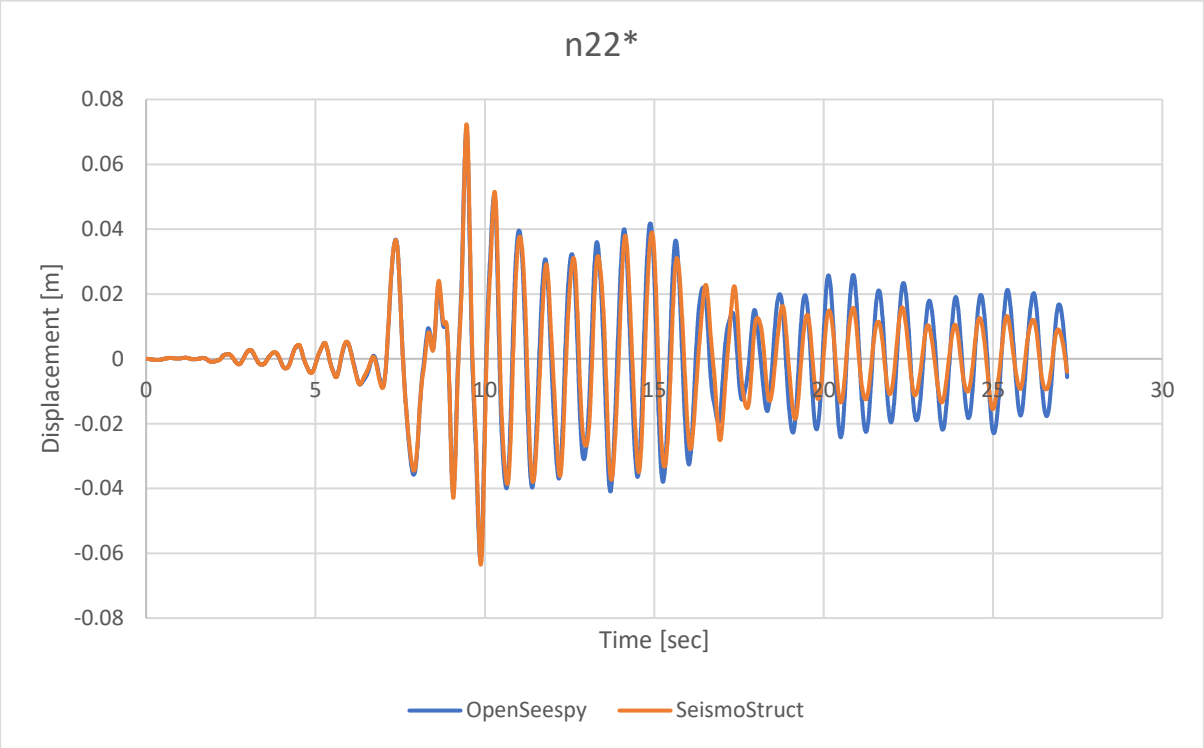
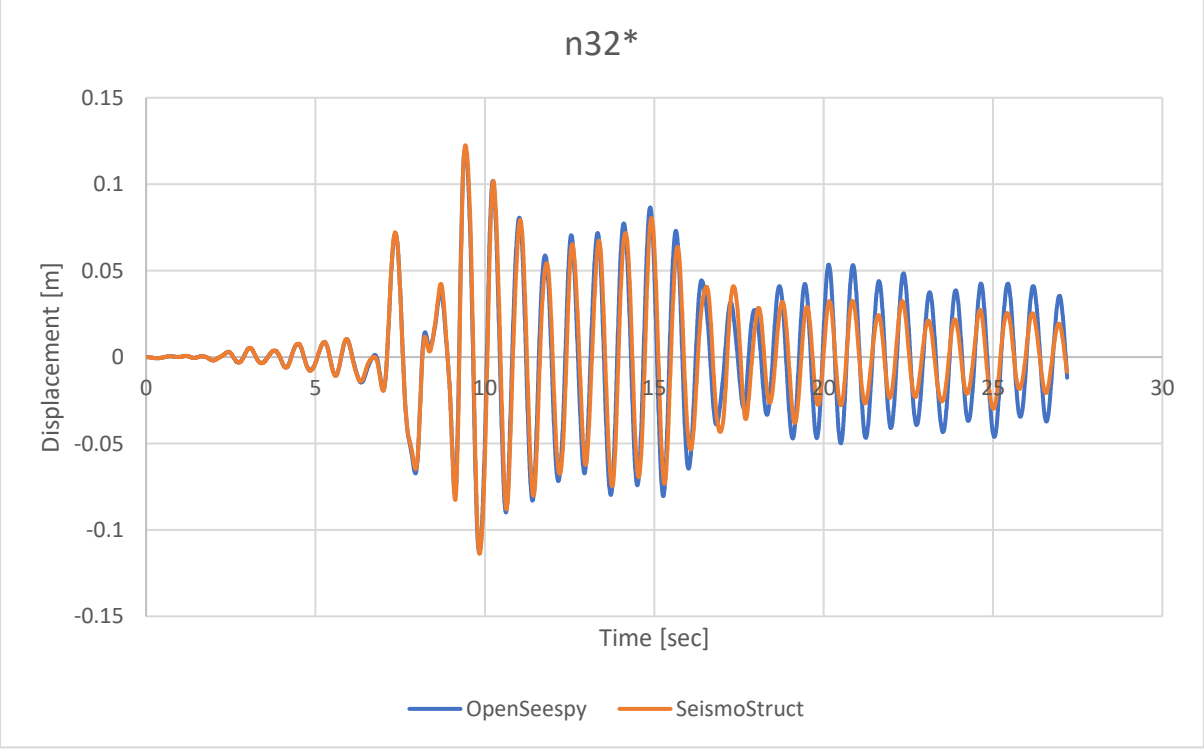
Nonlinear Response History Analysis (Longitudinal Direction)

SeismoStruct, Analysis time: 0 hours: 4 minutes: 22 seconds

OpenSeespy, Analysis time: 0 hours: 0 minutes: 15.67 seconds



Nonlinear Response History Analysis (Transversal Direction)

SeismoStruct, Analysis time: 0 hours: 5 minutes: 59 seconds

OpenSeespy, Analysis time: 0 hours: 0 minutes: 26.69 seconds