To smoothen out the data variability and differences in the three datasets and account for global outliers found, here is the recommendation on smoothing out the data:

Units for Max Stress MPA

	Max stress at 1 mm cantilever end displacement			Max stress at 5 mm cantilever end displacement			
Volume Fractio	Holes	Mat A	Mat B	Holes	Mat A	Mat B	
0.1	447.3	357	226	2236	1785	1130	
0.15	270.9	233.6	217.9	1355	1168	1090	
0.2	513.7	377.3	233.1	2568	1887	1165	
0.25	481.6	349.2	226.1	2408	1746	1133	
0.3	435.5	325.5	227.4	2178	1628	1137	
0.35	472.1	438	238.2	2361	1740	1191	
0.4	461.6	376.3	253.3	2308	1881	1266	
0.45	871.7	580.1	256	4358	2900	1280	871.7
0.5	278.2	258.8	235.6	1391	1294	1178	
0.55	485.6	347.2	273.7	2428	1736	1369	
0.6	284.1	293	265.1	1421	1465	1326	
0.65	195.5	399	309	977.4	1995	1545	
0.7	455.4	415.5	313.8	2277	415.5	1569	
	1.2357647	0.959243407	1.081596621	1.235474899	-0.104406797	1.084013971	SKEW

Data Set 2

Direction Down	Max stress at 1 mm cantilever end displacement			Max stress at 5 mm cantilever end displacement			
Volume Fractio	Holes	Mat A	Mat B	Holes	Mat A	Mat B	
0.1	622.2448	382.41037	281.1238	3111.224	1912.052	281.1238	
0.15	338.8414	247.766159	270.4947	1694.207	1238.831	270.4947	
0.2	627.9702	421.764526	257.462	3139.851	2108.822	257.462	
0.25	596.8199	400.048889	284.4005	2984.1	2000.244	284.4005	
0.3	344.0836	270.011566	280.1042	1720.418	1350.058	280.1042	
0.35	534.295	288.397522	278.4342	2671.475	1441.988	278.4342	
0.4	384.0533	270.313843	285.0964	1920.267	1351.569	285.0964	
0.45	562.757	403.45932	310.4611	2813.785	2017.297	310.4611	
0.5	425.7577	333.556854	305.1353	2128.788	1667.784	305.1353	
0.55	330.0016	340.363647	322.4433	1650.008	1701.818	322.4433	
0.6	411.0307	393.639832	322.5807	2055.154	1968.199	322.5807	
0.65	485.8028	451.577881	322.5977	2429.014	2257.889	322.5977	
0.7	436.1982	390.22345	328.4326	2180.991	1951.117	328.4326	
	0.2216839	-0.3312122	0.025807323	0.22168399	-0.331212396	0.025807323	SKEW

Data Set 1

Direction Down	Max stress at 1 mm cantilever end displacement			Max stress at 5 mm cantilever end displacement			
Volume Fractio	Holes	Mat A	Mat B	Holes	Mat A	Mat B	
0.1	347.613	310.234	291.05	1738.07	1551.17	1455.25	
0.15	359.08	256.346	293.229	1795.4	1281.73	1466.15	
0.2	454.594	247.325	299.539	2272.97	1236.63	1497.7	
0.25	305.303	282.48	296.22	1526.51	1412.4	1481.11	
0.3	337.884	272.717	308.474	1689.42	1363.58	1542.37	
0.35	589.65	343.193	308.453	2948.25	1715.97	1542.26	
0.4	520.482	334.245	302.148	2602.42	1671.22	1510.74	
0.45	532.067	286.829	315.039	2660.34	1434.15	1575.19	
0.5	396.119	394.028	313.111	1980.59	1970.14	1565.56	
0.55	377.361	294.543	325.115	1886.8	1472.21	1625.58	
0.6	208.163	405.615	333.695	1040.81	2028.08	1668.48	
0.65	212.252	387.345	327.577	1061.26	1936.73	1637.89	
0.7	162.654	458.921	359.343	813.269	2294.6	1796.72	
	0.0799044	0.645456802	1.141165051	0.079908428	0.645613333	1.141212188	SKEW

Units for Displacement mm

	Displacement at cantilever end at 100 N end load			Displacement at cantilever end at 500 N end load			
Volume Fraction	Holes	Mat A	Mat B	Holes	Mat A	Mat B	
0.1	0.88	0.81	0.63	4.41	4.06	3.14	
0.15	0.76	0.73	0.65	3.82	3.64	3.23	
0.2	1.16	0.95	0.60	5.79	4.74	3.02	
0.25	0.97	0.84	0.62	4.85	4.20	3.10	
0.3	1.11	0.90	0.60	5.53	4.48	3.02	
0.35	1.30	0.96	0.59	6.48	4.82	2.94	
0.4	1.63	1.13	0.57	8.14	5.65	2.86	
0.45	2.68	1.24	0.55	13.38	6.20	2.74	
0.5	1.54	1.03	0.56	7.68	5.17	2.82	
0.55	3.87	1.69	0.50	19.20	8.46	2.51	
0.6	3.08	1.36	0.52	15.41	6.78	2.59	
0.65	7.38	1.54	0.49	36.89	7.72	2.46	
0.7	9.17	1.91	0.46	45.84	9.52	2.32	
	1.75944	0.8649346	-0.400895686	1.764110289	0.865435	-0.403095298	SKEW

U Magnitude

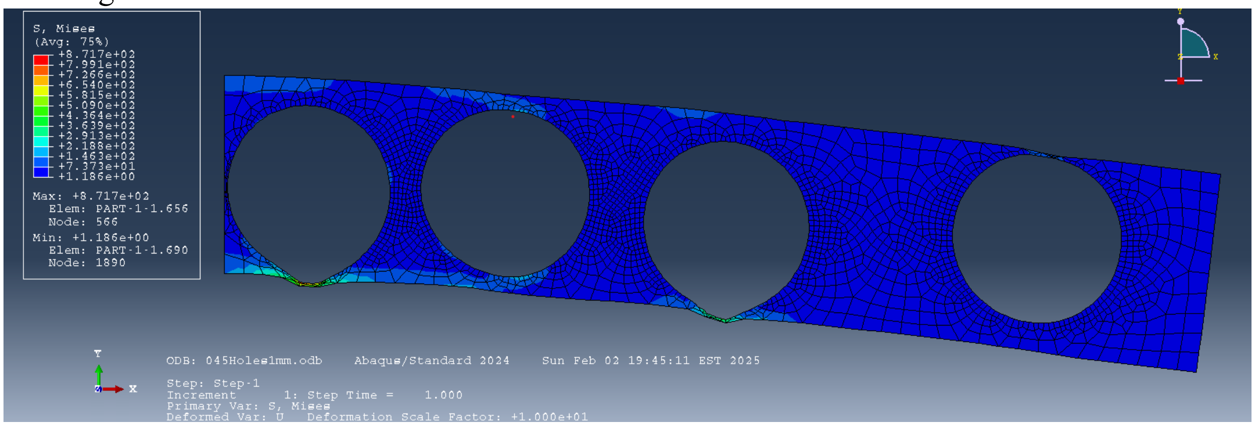
	Displacement at cantilever end at 100 N end load			Displacement at cantilever end at 500 N end load			
Volume Fraction	Holes	Mat A	Mat B	Holes	Mat A	Mat B	
0.1	0.97549	0.8118544	0.63321126	5.852968693	4.871127	3.79926753	
0.15	0.77769	0.7183398	0.65866578	4.666116714	4.310039	3.95199466	
0.2	1.01017	0.8148219	0.63839102	6.061004639	4.888932	3.83034611	
0.25	1.20768	0.910269	0.62354016	7.246062279	5.461614	3.74124074	
0.3	0.98537	0.8390453	0.62064612	5.912212372	5.034271	3.72387695	
0.35	1.11887	0.877953	0.60921901	6.713216782	5.267718	3.65531397	
0.4	1.21136	0.8696523	0.61592317	7.268157482	5.217913	3.695539	
0.45	1.8259	1.2023917	0.55895829	10.95540524	7.21435	3.35374975	
0.5	1.95962	1.1775166	0.55060107	11.7577076	7.0651	3.30360651	
0.55	2.42762	1.2991489	0.54038113	14.56569672	7.794894	3.24228668	
0.6	2.55957	1.4082384	0.51242006	15.35739136	8.44943	3.07452035	
0.65	3.95264	1.5463021	0.49870613	23.71582222	9.277812	2.99223685	
0.7	5.85599	1.6380326	0.49126866	35.13594055	9.828196	2.94761205	
	1.85157	0.6031756	-0.354720782	1.851567485	0.603176	-0.35472068	SKEW

	Displacement at cantilever end at 100 N end load			Displacement at cantilever end at 500 N end load			
Volume Fraction	Holes	Mat A	Mat B	Holes	Mat A	Mat B	
0.1	-0.739	-0.735191	-0.63744	-3.6948	-3.67595	-3.1872	
0.15	-0.8555	-0.723759	-0.63121	-4.27761	-3.61879	-3.15605	
0.2	-0.8488	-0.750971	-0.61675	-4.24409	-3.75458	-3.08375	
0.25	-0.8525	-0.774226	-0.614885	-4.26225	-3.87113	-3.07442	
0.3	-0.9859	-0.833196	-0.596528	-4.92966	-4.16598	-2.98264	
0.35	-1.2457	-0.899816	-0.592495	-6.22836	-4.49908	-2.96247	
0.4	-1.4191	-0.977682	-0.575703	-7.09561	-4.88841	-2.87851	
0.45	-1.6689	-0.9663	-0.577702	-8.34452	-4.8315	-2.88851	
0.5	-2.1589	-1.10828	-0.558918	-10.7947	-5.54139	-2.79459	
0.55	-2.7256	-1.19047	-0.535038	-13.628	-5.95235	-2.67519	
0.6	-9.344	-1.35998	-0.507666	-46.7202	-6.7999	-2.53833	
0.65	-16.488	-1.40595	-0.509413	-82.4393	-7.02977	-2.54706	
0.7	-233.19	-1.55324	-0.474383	-1165.93	-7.76622	-2.37192	
	-3.5736	-0.708228	0.545881746	-3.573627059	-0.7082	0.545864249	SKEW

Given the skewness in the data (ranging from -3.57 to 1.76), the Box-Cox transformation can be an appropriate method to normalize the data and make it more suitable for analysis. This transformation is effective when data is positively skewed, as it helps to reduce skewness and achieve a normal distribution. Since the outlier appears to be caused by a physical effect influencing structural behavior, it would be important to perform the transformation both with and without the outlier. If the Box-Cox transformation is heavily distorted by this outlier, alternative transformations like the Yeo-Johnson or log transformation could be explored to see if they yield better results.

After applying the Box-Cox transformation, if successful in normalizing the skewed data, Kernel Density Estimation (KDE) could be used to smooth the distribution further. This technique can help visualize the underlying distribution and address any irregularities in the data that might not be immediately apparent from histograms.

Another key observation from scatter plots is that the primary deviation between my data and the provided datasets is due to a hole positioned too close to the beam's edge. This resulted in unrealistic deformation/resulting in unrealistic stress concentration in ABAQUS, which is unlikely to occur in a real-life scenario. In this case, removing the corresponding data point might be justified, as it appears to be an artifact of the simulation setup rather than a physically meaningful result.



Additionally, comparing different simulation runs, for example, those with and without voids, and Material A versus Material B—requires a fair comparison of stress and displacement results. Standardization is a useful approach here, as it eliminates differences in units and scales. This ensures that variations, such as changes in hole placement, can be analyzed more effectively without being influenced by differences in magnitude or units.