

BAB VI

KESIMPULAN DAN SARAN

6.1. KESIMPULAN

Berdasarkan hasil analisis dan pembahasan yang telah dilakukan, dapat ditarik beberapa kesimpulan sebagai berikut:

- a) Formulasi kekakuan lateral analitikal klasik menunjukkan kecenderungan menghasilkan nilai kekakuan lateral antar tingkat yang lebih tinggi dibandingkan dengan nilai aktual hasil analisis numerik. Deviasi ini bersifat sistematis dan dipengaruhi oleh konfigurasi global struktur.
- b) Kekakuan lateral aktual (K_{actual}) yang diperoleh dari hasil analisis numerik mampu merepresentasikan respons struktur secara lebih realistis, karena memperhitungkan interaksi elemen struktur dan perilaku global sistem portal.
- c) Faktor interaksi balok–kolom (α) terbukti mampu mengurangi tingkat overestimasi formulasi analitikal klasik dengan menangkap pengaruh deformasi balok dan interaksi elemen lokal pada suatu tingkat struktur.
- d) Jumlah bentang (N_b) teridentifikasi sebagai parameter konfigurasi yang berpengaruh signifikan terhadap kekakuan lateral antar tingkat. Peningkatan jumlah bentang meningkatkan kontribusi deformasi global yang tidak tertangkap oleh formulasi analitikal klasik.
- e) Faktor koreksi β berbasis jumlah bentang, yang dikembangkan melalui kalibrasi numerik, mampu merepresentasikan pengaruh konfigurasi global struktur secara sistematis.

- f) Kombinasi faktor α dan β menghasilkan formulasi kekakuan lateral terkalibrasi (K_{proposed}) yang menunjukkan kesesuaian yang jauh lebih baik terhadap kekakuan lateral aktual dibandingkan formulasi analitikal klasik, tanpa menghilangkan kesederhanaan bentuk analitis.
- g) Formulasi K_{proposed} berpotensi digunakan sebagai alat estimasi praktis untuk evaluasi kekakuan lateral antar tingkat pada struktur portal beton bertulang, khususnya pada tahap pradesain dan studi parametrik.

6.2. SARAN

Berdasarkan keterbatasan dan ruang pengembangan penelitian ini, beberapa saran yang dapat diajukan adalah sebagai berikut:

- a) Penelitian selanjutnya disarankan untuk memperluas kajian pada perilaku nonlinier, dengan mempertimbangkan efek retak beton, plastisitas material, dan degradasi kekakuan akibat pembebanan gempa kuat.
- b) Pengembangan formulasi dapat diperluas pada struktur tiga dimensi (3D) serta sistem struktur lain, seperti rangka dengan dinding pengisi atau sistem rangka–dinding geser, untuk mengevaluasi generalisasi pendekatan yang diusulkan.
- c) Studi lanjutan dapat mengkaji pengaruh elemen non-struktural, variasi dimensi elemen, serta ketidakaturan geometris terhadap kekakuan lateral antar tingkat.
- d) Validasi lebih lanjut menggunakan analisis dinamik riwayat waktu (time history analysis) disarankan untuk menguji kinerja formulasi terkalibrasi pada kondisi pembebanan gempa yang lebih realistis.

- e) Formulasi K_{proposed} dapat dievaluasi potensinya untuk diintegrasikan sebagai pendekatan estimasi awal dalam pedoman perencanaan atau evaluasi struktur tahan gempa, khususnya pada tahap konseptual.



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LAMPIRAN



Frame	Story	A (mm)	A (m)	δ (m)	F (kN)	V (kN)	K Actual										K Analytical										α = $\frac{\Sigma(EI_b/L_b)}{\Sigma(EI_{ct}/H_{ct}) + (EI_{cb}/H_{cb})}$	α*K Analytical	β _s (N _b) = c _s + a _s N _b ^{b_s}	K Proposed	Rasio
							K=V/δ (kN/m)	E	bb	hb	bc	hc	Ic	Ib	Σ Column	Σ Beam	Hc	Lb	$\frac{\Sigma 12EI}{H^3}$												
1	1	1.386	0.001386	0.001386	10	10	7215.007	2.57E+07	0.30	0.50	0.40	0.40	2.13E-03	3.13E-03	2	1	5.00	5.00	10544.316	0.732	7722.888	0.698	5393.789	133.77%							
2	2	4.151	0.004151	0.001421	10	10	7037.298	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	4.00	5.00	30167.531	0.273	8237.747	0.698	5753.374	122.32%							
	1	2.730	0.002730	0.002730	10	20	7326.007	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	5.00	5.00	15445.776	0.195	3012.662	2.299	6927.016	105.76%							
3	3	8.528	0.008528	0.001511	10	10	6618.134	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	4.00	5.00	30167.531	0.273	8237.747	0.698	5753.374	115.03%							
	2	7.017	0.007017	0.002768	10	20	7225.434	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	4.00	5.00	30167.531	0.182	5491.832	1.212	6655.001	108.57%							
	1	4.249	0.004249	0.004249	10	30	7060.485	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	5.00	5.00	15445.776	0.195	3012.662	2.299	6927.016	101.93%							
4	4	14.496	0.014496	0.001625	10	10	6153.846	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	4.00	5.00	30167.531	0.273	8237.747	0.698	5753.374	106.96%							
	3	12.871	0.012871	0.002902	10	20	6891.799	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	4.00	5.00	30167.531	0.182	5491.832	1.212	6655.001	103.56%							
	2	9.969	0.009969	0.004185	10	30	7168.459	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	4.00	5.00	30167.531	0.182	5491.832	1.212	6655.001	107.72%							
	1	5.784	0.005784	0.005784	10	40	6915.629	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	5.00	5.00	15445.776	0.195	3012.662	2.299	6927.016	99.84%							
5	5	22.205	0.022205	0.001796	10	10	5567.929	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	4.00	5.00	30167.531	0.273	8237.747	0.698	5753.374	96.78%							
	4	20.409	0.020409	0.003075	10	20	6504.065	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	4.00	5.00	30167.531	0.182	5491.832	1.212	6655.001	97.73%							
	3	17.334	0.017334	0.004375	10	30	6857.143	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	4.00	5.00	30167.531	0.182	5491.832	1.212	6655.001	103.04%							
	2	12.959	0.012959	0.005630	10	40	7104.796	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	4.00	5.00	30167.531	0.182	5491.832	1.212	6655.001	106.76%							
	1	7.329	0.007329	0.007329	10	50	6822.213	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	5.00	5.00	15445.776	0.195	3012.662	2.299	6927.016	98.49%							
6	6	31.844	0.031844	0.002038	10	10	4906.771	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	4.00	5.00	30167.531	0.273	8237.747	0.698	5753.374	85.29%							
	5	29.806	0.029806	0.003317	10	20	6029.545	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	4.00	5.00	30167.531	0.182	5491.832	1.212	6655.001	90.60%							
	4	26.489	0.026489	0.004620	10	30	6493.506	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	4.00	5.00	30167.531	0.182	5491.832	1.212	6655.001	97.57%							
	3	21.869	0.021869	0.005888	10	40	6793.478	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	4.00	5.00	30167.531	0.182	5491.832	1.212	6655.001	102.08%							
	2	15.981	0.015981	0.007097	10	50	7045.230	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	4.00	5.00	30167.531	0.182	5491.832	1.212	6655.001	105.86%							
	1	8.884	0.008884	0.008884	10	60	6753.715	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	5.00	5.00	15445.776	0.195	3012.662	2.299	6927.016	97.50%							
7	7	43.640	0.043640	0.002364	10	10	4230.118	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	4.00	5.00	30167.531	0.273	8237.747	0.698	5753.374	73.52%							
	6	41.276	0.041276	0.003643	10	20	5489.981	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	4.00	5.00	30167.531	0.182	5491.832	1.212	6655.001	82.49%							
	5	37.633	0.037633	0.004946	10	30	6065.507	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	4.00	5.00	30167.531	0.182	5491.832	1.212	6655.001	91.14%							
	4	32.687	0.032687	0.006216	10	40	6435.006	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	4.00	5.00	30167.531	0.182	5491.832	1.212	6655.001	96.69%							
	3	26.471	0.026471	0.007436	10	50	6724.045	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	4.00	5.00	30167.531	0.182	5491.832	1.212	6655.001	101.04%							
	2	19.035	0.019035	0.008586	10	60	6988.120	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	4.00	5.00	30167.531	0.182	5491.832	1.212	6655.001	105.01%							
	1	10.449	0.010449	0.010449	10	70	6699.206	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	2	1	5.00	5.00	15445.776	0.195	3012.662	2.299	6927.016	96.71%							
8	1	0.829	0.000829	0.000829	10	10	12062.726	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	3	2	5.00	5.00	23168.664	0.455	10544.316	0.665		#DIV/0!							
9	2	2.574	0.002574	0.000835	10	10	11976.048	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	3	2	4.00	5.00	45251.297	0.364	16475.495	0.665	10949.365	109.38%							
	1	1.739	0.001739	0.001739	10	20	11500.863	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	3	2	5.00	5.00	23168.664	0.287	6659.568										

15	1	0.612	0.000612	0.000612	10	10	16339.869	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	5.00	5.00	30891.552	0.512	15816.475	0.654	10347.572	157.91%
16	2	1.859	0.001859	0.000584	10	10	17123.288	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	4.00	5.00	60335.063	0.410	24713.242	0.654	16168.081	105.91%
	1	1.275	0.001275	0.001275	10	20	15686.275	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	5.00	5.00	30891.552	0.341	10544.316	1.435	15129.557	103.68%
17	3	3.680	0.003680	0.000585	10	10	17094.017	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	4.00	5.00	60335.063	0.410	24713.242	0.654	16168.081	105.73%
	2	3.095	0.003095	0.001136	10	20	17605.634	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	4.00	5.00	60335.063	0.328	19770.593	0.877	17345.835	101.50%
	1	1.959	0.001959	0.001959	10	30	15313.936	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	5.00	5.00	30891.552	0.341	10544.316	1.435	15129.557	101.22%
18	4	6.085	0.006085	0.000600	10	10	16666.667	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	4.00	5.00	60335.063	0.410	24713.242	0.654	16168.081	103.08%
	3	5.485	0.005485	0.001134	10	20	17636.684	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	4.00	5.00	60335.063	0.328	19770.593	0.877	17345.835	101.68%
	2	4.351	0.004351	0.001706	10	30	17584.994	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	4.00	5.00	60335.063	0.328	19770.593	0.877	17345.835	101.38%
	1	2.645	0.002645	0.002645	10	40	15122.873	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	5.00	5.00	30891.552	0.341	10544.316	1.435	15129.557	99.96%
19	5	9.091	0.009091	0.000621	10	10	16103.060	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	4.00	5.00	60335.063	0.410	24713.242	0.654	16168.081	99.60%
	4	8.470	0.008470	0.001155	10	20	17316.017	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	4.00	5.00	60335.063	0.328	19770.593	0.877	17345.835	99.83%
	3	7.315	0.007315	0.001704	10	30	17605.634	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	4.00	5.00	60335.063	0.328	19770.593	0.877	17345.835	101.50%
	2	5.611	0.005611	0.002278	10	40	17559.263	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	4.00	5.00	60335.063	0.328	19770.593	0.877	17345.835	101.23%
	1	3.333	0.003333	0.003333	10	50	15001.500	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	5.00	5.00	30891.552	0.341	10544.316	1.435	15129.557	99.15%
20	6	12.721	0.012721	0.000651	10	10	15360.983	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	4.00	5.00	60335.063	0.410	24713.242	0.654	16168.081	95.01%
	5	12.070	0.012070	0.001184	10	20	16891.892	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	4.00	5.00	60335.063	0.328	19770.593	0.877	17345.835	97.38%
	4	10.886	0.010886	0.001733	10	30	17311.021	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	4.00	5.00	60335.063	0.328	19770.593	0.877	17345.835	99.80%
	3	9.153	0.009153	0.002277	10	40	17566.974	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	4.00	5.00	60335.063	0.328	19770.593	0.877	17345.835	101.27%
	2	6.876	0.006876	0.002855	10	50	17513.135	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	4.00	5.00	60335.063	0.328	19770.593	0.877	17345.835	100.96%
	1	4.021	0.004021	0.004021	10	60	14921.661	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	5.00	5.00	30891.552	0.341	10544.316	1.435	15129.557	98.63%
21	7	16.997	0.016997	0.000689	10	10	14513.788	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	4.00	5.00	60335.063	0.410	24713.242	0.654	16168.081	89.77%
	6	16.308	0.016308	0.001222	10	20	16366.612	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	4.00	5.00	60335.063	0.328	19770.593	0.877	17345.835	94.35%
	5	15.086	0.015086	0.001771	10	30	16939.582	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	4.00	5.00	60335.063	0.328	19770.593	0.877	17345.835	97.66%
	4	13.315	0.013315	0.002316	10	40	17271.157	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	4.00	5.00	60335.063	0.328	19770.593	0.877	17345.835	99.57%
	3	10.999	0.010999	0.002855	10	50	17513.135	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	4.00	5.00	60335.063	0.328	19770.593	0.877	17345.835	100.96%
	2	8.144	0.008144	0.003433	10	60	17477.425	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	4.00	5.00	60335.063	0.328	19770.593	0.877	17345.835	100.76%
	1	4.711	0.004711	0.004711	10	70	14858.841	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	4	3	5.00	5.00	30891.552	0.341	10544.316	1.435	15129.557	98.21%
22	1	0.490	0.000490	0.000490	10	10	20408.163	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	5	4	5.00	5.00	38614.440	0.546	21088.633	0.649	13693.098	149.04%
23	2	1.460	0.001460	0.000449	10	10	22271.715	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	5	4	4.00	5.00	75418.829	0.437	32950.989	0.649	21395.466	104.10%
	1	1.011	0.001011	0.001011	10	20	19782.394	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	5	4	5.00	5.00	38614.440	0.377	14543.885	1.318	19169.253	103.20%
24	3	2.869	0.002869	0.000447	10	10	22371.365	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	5	4	4.00	5.00	75418.829	0.437	32950.989	0.649	21395.466	104.56%
	2	2.422	0.002422	0.000875	10	20	22857.143	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	5	4	4.00	5.00	75418.829	0.364	27459.158	0.827	22711.050	100.64%
	1	1.547	0.001547	0.001547	10	30	19392.372	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	5	4	5.00	5.00	38614.440	0.377	14543.885	1.318	19169.253	101.16%
25	4	4.721	0.004721	0.000455	10	10	21978.022	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	5	4	4.00	5.00	75418.829	0.437	32950.989	0.649	21395.466	102.72%
	3	4.266	0.004266	0.000869	10	20	23014.960	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	5	4	4.00	5.00	75418.829	0.364	27459.158	0.827	22711.050	101.34%
	2	3.397	0.003397	0.001312	10	30	22865.854	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	5	4	4.00	5.00	75418.829	0.364	27459.158	0.827	22711.050	100.68%
	1	2.085	0.002085	0.002085	10	40	19184.652	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	5	4	5.00	5.00	38614.440	0.377	14543.885	1.318	19169.253	100.08%
26	5	7.028	0.007028	0.000468	10	10	21367.521	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	5	4	4.00	5.00	75418.829	0.437	32950.989	0.649	21395.466	99.87%
	4	6.560	0.006560	0.000881	10	20	22701.476	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	5	4	4.00	5.00	75418.829	0.364	27459.158	0.827	22711.050	99.96%
	3	5.679	0.005679	0.001304	10	30	23006.135	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	5	4	4.00	5.00	75418.829	0.364	27459.158	0.827	22711.050	101.30%
	2	4.375	0.004375	0.001752	10	40	22831.050	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	5	4	4.00	5.00	75418.829	0.364	27459.158	0.827	22711.050	100.53%
	1	2.623	0.002623	0.002623	10	50	19062.143	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	5	4	5.00	5.00	38614.440	0.377	14543.885	1.318	19169.253	99.44%
27	6	9.801	0.009801	0.000485	10	10	20618.5																	

29	1	0.411	0.000411	0.000411	10	10	24330.900	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	5.00	5.00	46337.328	0.569	26360.791	0.646	17041.528	142.77%
30	2	1.206	0.001206	0.000365	10	10	27397.260	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	4.00	5.00	90502.594	0.455	41188.736	0.646	26627.388	102.89%
	1	0.841	0.000841	0.000841	10	20	23781.213	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	5.00	5.00	46337.328	0.402	18607.617	1.246	23186.971	102.56%
31	3	2.354	0.002354	0.000361	10	10	27700.831	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	4.00	5.00	90502.594	0.455	41188.736	0.646	26627.388	104.03%
	2	1.993	0.001993	0.000711	10	20	28129.395	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	4.00	5.00	90502.594	0.390	35304.631	0.795	28067.619	100.22%
	1	1.282	0.001282	0.001282	10	30	23400.936	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	5.00	5.00	46337.328	0.402	18607.617	1.246	23186.971	100.92%
32	4	3.861	0.003861	0.000367	10	10	27247.956	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	4.00	5.00	90502.594	0.455	41188.736	0.646	26627.388	102.33%
	3	3.494	0.003494	0.000704	10	20	28409.091	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	4.00	5.00	90502.594	0.390	35304.631	0.795	28067.619	101.22%
	2	2.790	0.002790	0.001066	10	30	28142.589	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	4.00	5.00	90502.594	0.390	35304.631	0.795	28067.619	100.27%
	1	1.724	0.001724	0.001724	10	40	23201.856	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	5.00	5.00	46337.328	0.402	18607.617	1.246	23186.971	100.06%
33	5	5.732	0.005732	0.000375	10	10	26666.667	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	4.00	5.00	90502.594	0.455	41188.736	0.646	26627.388	100.15%
	4	5.357	0.005357	0.000711	10	20	28129.395	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	4.00	5.00	90502.594	0.390	35304.631	0.795	28067.619	100.22%
	3	4.646	0.004646	0.001057	10	30	28382.214	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	4.00	5.00	90502.594	0.390	35304.631	0.795	28067.619	101.12%
	2	3.589	0.003589	0.001422	10	40	28129.395	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	4.00	5.00	90502.594	0.390	35304.631	0.795	28067.619	100.22%
	1	2.167	0.002167	0.002167	10	50	23073.373	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	5.00	5.00	46337.328	0.402	18607.617	1.246	23186.971	99.51%
34	6	7.977	0.007977	0.000387	10	10	25839.793	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	4.00	5.00	90502.594	0.455	41188.736	0.646	26627.388	97.04%
	5	7.590	0.007590	0.000722	10	20	27700.831	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	4.00	5.00	90502.594	0.390	35304.631	0.795	28067.619	98.69%
	4	6.868	0.006868	0.001068	10	30	28089.888	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	4.00	5.00	90502.594	0.390	35304.631	0.795	28067.619	100.08%
	3	5.800	0.005800	0.001410	10	40	28368.794	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	4.00	5.00	90502.594	0.390	35304.631	0.795	28067.619	101.07%
	2	4.390	0.004390	0.001780	10	50	28089.888	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	4.00	5.00	90502.594	0.390	35304.631	0.795	28067.619	100.08%
	1	2.610	0.002610	0.002610	10	60	22988.506	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	5.00	5.00	46337.328	0.402	18607.617	1.246	23186.971	99.14%
35	7	10.603	0.010603	0.000401	10	10	24937.656	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	4.00	5.00	90502.594	0.455	41188.736	0.646	26627.388	93.65%
	6	10.202	0.010202	0.000737	10	20	27137.042	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	4.00	5.00	90502.594	0.390	35304.631	0.795	28067.619	96.68%
	5	9.465	0.009465	0.001082	10	30	27726.433	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	4.00	5.00	90502.594	0.390	35304.631	0.795	28067.619	98.78%
	4	8.383	0.008383	0.001425	10	40	28070.175	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	4.00	5.00	90502.594	0.390	35304.631	0.795	28067.619	100.01%
	3	6.958	0.006958	0.001766	10	50	28312.571	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	4.00	5.00	90502.594	0.390	35304.631	0.795	28067.619	100.87%
	2	5.192	0.005192	0.002139	10	60	28050.491	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	4.00	5.00	90502.594	0.390	35304.631	0.795	28067.619	99.94%
	1	3.053	0.003053	0.003053	10	70	22928.267	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	6	5	5.00	5.00	46337.328	0.402	18607.617	1.246	23186.971	98.88%
36	1	0.357	0.000357	0.000357	10	10	28011.204	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	7	6	5.00	5.00	54060.216	0.585	31632.949	0.645	20391.734	137.37%
37	2	1.030	0.001030	0.000307	10	10	32573.290	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	7	6	4.00	5.00	105586.360	0.468	49426.484	0.645	31862.084	102.23%
	1	0.723	0.000723	0.000723	10	20	27662.517	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	7	6	5.00	5.00	54060.216	0.420	22710.836	1.197	27188.529	101.74%
38	3	2.000	0.002000	0.000304	10	10	32894.737	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	7	6	4.00	5.00	105586.360	0.468	49426.484	0.645	31862.084	

43	1	0.318	0.000318	0.000318	10	10	31446.541	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	5.00	5.00	61783.104	0.597	36905.108	0.643	23743.130	132.44%
44	2	0.902	0.000902	0.000266	10	10	37593.985	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	4.00	5.00	120670.126	0.478	57664.231	0.643	37098.641	101.34%
	1	0.636	0.000636	0.000636	10	20	31446.541	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	5.00	5.00	61783.104	0.434	26840.078	1.162	31177.660	100.86%
																					0.000			
45	3	1.741	0.001741	0.000261	10	10	38314.176	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	4.00	5.00	120670.126	0.478	57664.231	0.643	37098.641	103.28%
	2	1.480	0.001480	0.000518	10	20	38610.039	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	4.00	5.00	120670.126	0.425	51257.094	0.756	38744.010	99.65%
	1	0.962	0.000962	0.000962	10	30	31185.031	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	5.00	5.00	61783.104	0.434	26840.078	1.162	31177.660	100.02%
46	4	2.838	0.002838	0.000264	10	10	37878.788	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	4.00	5.00	120670.126	0.478	57664.231	0.643	37098.641	102.10%
	3	2.574	0.002574	0.000510	10	20	39215.686	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	4.00	5.00	120670.126	0.425	51257.094	0.756	38744.010	101.22%
	2	2.064	0.002064	0.000776	10	30	38659.794	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	4.00	5.00	120670.126	0.425	51257.094	0.756	38744.010	99.78%
	1	1.288	0.001288	0.001288	10	40	31055.901	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	5.00	5.00	61783.104	0.434	26840.078	1.162	31177.660	99.61%
47	5	4.197	0.004197	0.000269	10	10	37174.721	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	4.00	5.00	120670.126	0.478	57664.231	0.643	37098.641	100.21%
	4	3.928	0.003928	0.000514	10	20	38910.506	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	4.00	5.00	120670.126	0.425	51257.094	0.756	38744.010	100.43%
	3	3.414	0.003414	0.000765	10	30	39215.686	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	4.00	5.00	120670.126	0.425	51257.094	0.756	38744.010	101.22%
	2	2.649	0.002649	0.001035	10	40	38647.343	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	4.00	5.00	120670.126	0.425	51257.094	0.756	38744.010	99.75%
	1	1.614	0.001614	0.001614	10	50	30978.934	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	5.00	5.00	61783.104	0.434	26840.078	1.162	31177.660	99.36%
48	6	5.822	0.005822	0.000275	10	10	36363.636	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	4.00	5.00	120670.126	0.478	57664.231	0.643	37098.641	98.02%
	5	5.547	0.005547	0.000520	10	20	38461.538	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	4.00	5.00	120670.126	0.425	51257.094	0.756	38744.010	99.27%
	4	5.027	0.005027	0.000771	10	30	38910.506	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	4.00	5.00	120670.126	0.425	51257.094	0.756	38744.010	100.43%
	3	4.256	0.004256	0.001021	10	40	39177.277	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	4.00	5.00	120670.126	0.425	51257.094	0.756	38744.010	101.12%
	2	3.235	0.003235	0.001294	10	50	38639.876	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	4.00	5.00	120670.126	0.425	51257.094	0.756	38744.010	99.73%
	1	1.941	0.001941	0.001941	10	60	30911.901	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	5.00	5.00	61783.104	0.434	26840.078	1.162	31177.660	99.15%
49	7	7.718	0.007718	0.000283	10	10	35335.689	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	4.00	5.00	120670.126	0.478	57664.231	0.643	37098.641	95.25%
	6	7.435	0.007435	0.000527	10	20	37950.664	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	4.00	5.00	120670.126	0.425	51257.094	0.756	38744.010	97.95%
	5	6.908	0.006908	0.000779	10	30	38510.911	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	4.00	5.00	120670.126	0.425	51257.094	0.756	38744.010	99.40%
	4	6.129	0.006129	0.001029	10	40	38872.692	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	4.00	5.00	120670.126	0.425	51257.094	0.756	38744.010	100.33%
	3	5.100	0.005100	0.001278	10	50	39123.631	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	4.00	5.00	120670.126	0.425	51257.094	0.756	38744.010	100.98%
	2	3.822	0.003822	0.001554	10	60	38610.039	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	4.00	5.00	120670.126	0.425	51257.094	0.756	38744.010	99.65%
	1	2.268	0.002268	0.002268	10	70	30864.198	2.57E+07	0.30	0.50	0.40	0.40	3.13E-03	2.13E-03	8	7	5.00	5.00	61783.104	0.434	26840.078	1.162	31177.660	98.99%