A Simulationsparameter

Uras-Simulation für das System CO/CO_2/Grau-Fehler:

Gewählte Konzentrationsbereiche: CO von 10 ppm bis 500 ppm (entspricht : 0,001 bis 0.05 Vol.%) CO_2 von 15000 ppm bis 750000 ppm (entspricht : 1,5 bis 75 Vol.%) Grauanteil von 99,9 %T bis 95 %T (entspricht einer Verschmutzung von 0,1 bis 5 %) Frequenzbereich : 4, 6, 7.3 und 8 Hz

Tabelle A.1: Simulationsparameter für das System CO / CO_2 / Grauanteil

Strahler	Fenster		Spiegel	Chopper
	Transm.	Refelk.	Faktor	Freqenz
ir_1	CaF_2	0.05	1	4 bis 8

Leck		
l/mm	d/mm	b/(cm^3/s)
0.006	0.055	598.9

Detektor		Füllgas			
Gas_1	p-Korr	Isaentrop.	T.leitf.	dyn.Visk.	Druck
CO	1.68	1.6	0.19	20	1

Detektorgeometrie									
d_v	d_h	l_v	l_h	Vt_v	Vt_h	dO_v	dO_h	opt-l_v	opt-l_h
1.8	1.8	0.5	1.36	3.1827	2.4	0	0	1	1

Tabelle A.2: Konzentrationsabhängigkeit der Amplitude beim CO für verschiedene Frequenzen

c(CO) [ppm]	4 [Hz]	6 [Hz]	7.3 [Hz]	8 [Hz]
10	14.732	12.7935	11.5539	10.9393
20	29.3757	25.5082	23.0359	21.8102
30	43.932	38.1449	34.4467	32.6133
40	58.401	50.7039	45.7865	43.3489
50	72.784	63.1859	57.0561	54.0179
60	87.081	75.5916	68.2559	64.6204
70	101.2927	87.9212	79.3864	75.157
80	115.4202	100.1755	90.448	85.6279
90	129.4636	112.355	101.4415	96.0344
100	143.4239	124.46	112.3669	106.376
110	157.3013	136.4918	123.2252	116.6538
120	171.0964	148.45	134.0168	126.8679
130	184.8098	160.3355	144.7421	137.0188
140	198.4422	172.1483	155.4011	147.1072
150	211.9939	183.8896	165.9948	157.1331
160	225.4658	195.5605	176.5237	167.0972
170	238.8584	207.1601	186.9881	177.0011
180	252.1723	218.6896	197.3887	186.8435
190	265.4071	230.15	207.7258	196.6247
200	278.5665	241.5402	217.9991	206.347
210	291.6465	252.8625	228.2104	216.0091
220	304.6514	264.1169	238.3595	225.6128
230	317.5783	275.3024	248.4469	235.1576
240	330.4314	286.422	258.4728	244.6433
250	343.2086	297.4741	268.438	254.0721
260	355.9113	308.4601	278.3426	263.4424
270	368.54	319.3799	288.1872	272.7567
280	381.0951	330.2339	297.972	282.0135
290	393.5779	341.0246	307.6978	291.2144
300	405.9866	351.7486	317.3649	300.3594
310	418.3243	362.4097	326.9729	309.4489
320	430.5905	373.0081	336.5239	318.4826
330	442.7857	383.5432	346.017	327.4636
340	454.911	394.0157	355.454	336.3895
350	466.9663	404.4252	364.8329	345.2618
360	478.9504	414.7736	374.1566	354.079
370	490.866	425.0604	383.4237	362.844
380	502.7134	435.286	392.6356	371.5569
390	514.4938	445.452	401.7921	380.216
400	526.2056	455.5576	410.894	388.8243
410	537.8503	465.6025	419.9414	397.3806
420	549.4275	475.5891	428.9352	405.8855
430	560.9391	485.5165	437.8752	414.3398
440	572.3855	495.3866	446.7623	422.7437
450	583.7652	505.1975	455.5967	431.0963
460	595.0796	514.9504	464.3784	439.4014
470	606.332	524.6476	473.1072	447.6545
480	617.5178	534.2872	481.7847	455.859
490	628.6407	543.8704	490.4113	464.0158
500	639.7007	553.3969	498.9869	472.1233

Tabelle A.3: Konzentrationsabhängigkeit der Amplitude beim CO_2 für verschiedene Frequenzen

c(CO_2) [ppm]	4 [Hz]	6 [Hz]	7.3 [Hz]	8 [Hz]
15000	0.9491	0.7973	0.7198	0.6834
30000	1.6222	1.2835	1.1307	1.0628
45000	2.3256	1.7808	1.5437	1.4406
60000	3.0451	2.2877	1.9622	1.8221
75000	3.7738	2.8006	2.3846	2.2065
90000	4.5079	3.3172	2.8096	2.5928
105000	5.2455	3.8363	3.2363	2.9804
120000	5.9854	4.357	3.664	3.3687
135000	6.7268	4.8788	4.0924	3.7576
150000	7.4691	5.4012	4.5211	4.1465
165000	8.2119	5.924	4.95	4.5356
180000	8.9552	6.4468	5.3789	4.9245
195000	9.6984	6.9698	5.8076	5.3133
210000	10.4417	7.4927	6.2363	5.7018
225000	11.1849	8.0154	6.6647	6.0901
240000	11.9279	8.538	7.0927	6.478
255000	12.6703	9.0602	7.5205	6.8655
270000	13.4119	9.5821	7.948	7.2527
285000	14.1542	10.1034	8.375	7.6395
300000	14.8953	10.625	8.8017	8.0259
315000	15.636	11.1458	9.228	8.4119
330000	16.376	11.6661	9.6538	8.7974
345000	17.1157	12.186	10.0792	9.1825
360000	17.8545	12.7053	10.5042	9.5672
375000	18.5927	13.2241	10.9287	9.9514
390000	19.3304	13.7427	11.3527	10.3352
405000	20.067	14.2607	11.7762	10.7185
420000	20.8033	14.7781	12.1993	11.1012
435000	21.539	15.2952	12.622	11.4836
450000	22.2736	15.8116	13.0442	11.8656
465000	23.0077	16.3276	13.466	12.2471
480000	23.7413	16.843	13.8873	12.6282
495000	24.4741	17.358	14.3081	13.0088
510000	25.2059	17.8724	14.7285	13.389
525000	25.9371	18.3864	15.1483	13.7686
540000	26.6676	18.8997	15.5679	14.1479
555000	27.3953	19.4123	15.9867	14.5268
570000	28.1267	19.9247	16.4053	14.9052
585000	28.8552	20.4359	16.8233	15.2831
600000	29.5818	20.9482	17.2402	15.6606
615000	30.3085	21.459	17.6578	16.038
630000	31.034	21.969	18.0745	16.4146
645000	31.7596	22.4788	18.4907	16.7908
660000	32.4838	22.9877	18.9066	17.1665
675000	33.207	23.4965	19.3218	17.542
690000	33.93	24.0044	19.7367	17.9168
705000	34.6516	24.512	20.151	18.2914
720000	35.3726	25.0187	20.5649	18.6654
735000	36.0932	25.5253	20.9783	19.0391
750000	36.8126	26.0306	21.3912	19.4124

Tabelle A.4: Konzentrationsabhängigkeit der Amplitude beim Grauanteil

c(Grau) [1-%T]	4 [Hz]	6 [Hz]	7.3 [Hz]	8 [Hz]
0.1	1.3093	0.9531	0.7897	0.718
0.2	2.6172	1.9053	1.5786	1.4352
0.3	3.924	2.8565	2.3668	2.1518
0.4	5.2291	3.8067	3.154	2.8674
0.5	6.5333	4.7556	3.9405	3.5825
0.6	7.8362	5.7043	4.7265	4.2971
0.7	9.1351	6.6495	5.5114	5.0107
0.8	10.4374	7.5982	6.2954	5.7234
0.9	11.7358	8.5432	7.0788	6.4357
1.0	13.0338	9.4874	7.8613	7.1471
1.1	14.3304	10.4317	8.6433	7.8577
1.2	15.6255	11.3745	9.4248	8.5684
1.3	16.9187	12.316	10.205	9.2778
1.4	18.2058	13.2523	10.984	9.9862
1.5	19.5021	14.1917	11.7591	10.6906
1.6	20.7911	15.1353	12.5402	11.4009
1.7	22.0792	16.0732	13.318	12.1078
1.8	23.3656	17.0096	14.0938	12.8135
1.9	24.6514	17.9448	14.8695	13.5184
2.0	25.9368	18.8799	15.6436	14.2227
2.1	27.2213	19.8139	16.4175	14.9261
2.2	28.5033	20.7484	17.191	15.6288
2.3	29.7842	21.6813	17.9643	16.3323
2.4	31.0634	22.6125	18.7361	17.0342
2.5	32.341	23.543	19.5071	17.7351
2.6	33.618	24.472	20.2774	18.4351
2.7	34.8828	25.4002	21.0466	19.1346
2.8	36.1573	26.3197	21.8146	19.8326
2.9	37.4397	27.2465	22.5752	20.5309
3.0	38.7125	28.1716	23.342	21.2211
3.1	39.9817	29.104	24.1147	21.9179
3.2	41.2502	30.0287	24.8803	22.6203
3.3	42.518	30.9518	25.6459	23.3157
3.4	43.7832	31.8739	26.4102	24.011
3.5	45.0488	32.7946	27.1732	24.7047
3.6	46.3127	33.7145	27.9357	25.3983
3.7	47.5748	34.6331	28.6972	26.0897
3.8	48.8362	35.551	29.4576	26.7815
3.9	50.0969	36.4678	30.2174	27.4722
4.0	51.3573	37.384	30.9769	28.1629
4.1	52.6163	38.2999	31.7347	28.8518
4.2	53.8735	39.2139	32.4914	29.5411
4.3	55.1294	40.1284	33.2491	30.2289
4.4	56.3833	41.0427	34.0054	30.9162
4.5	57.6359	41.9555	34.7622	31.6037
4.6	58.8873	42.8663	35.518	32.2908
4.7	60.1378	43.777	36.2728	32.9771
4.8	61.3864	44.6866	37.0263	33.6624
4.9	62.6342	45.5944	37.7784	34.3463
5.0	63.8807	46.5013	38.5306	35.0305

Tabelle A.5: Konzentrationsabhängigkeit der Phasenlage beim CO für verschiedene Frequenzen

c(CO) [ppm]	4 [Hz]	6 [Hz]	7.3 [Hz]	8 [Hz]
10	-12.5912	-26.8892	-33.6541	-36.7018
20	-12.5941	-26.8922	-33.6572	-36.7048
30	-12.5971	-26.8952	-33.6602	-36.7078
40	-12.6	-26.8982	-33.6632	-36.7108
50	-12.6029	-26.9012	-33.6662	-36.7138
60	-12.6058	-26.9042	-33.6692	-36.7168
70	-12.6087	-26.9071	-33.6722	-36.7198
80	-12.6116	-26.9101	-33.6751	-36.7227
90	-12.6144	-26.913	-33.678	-36.7257
100	-12.6173	-26.916	-33.681	-36.7286
110	-12.6201	-26.9189	-33.6839	-36.7314
120	-12.6229	-26.9218	-33.6868	-36.7343
130	-12.6257	-26.9247	-33.6897	-36.7372
140	-12.6285	-26.9275	-33.6925	-36.7401
150	-12.6312	-26.9303	-33.6954	-36.7429
160	-12.634	-26.9332	-33.6982	-36.7457
170	-12.6367	-26.936	-33.701	-36.7486
180	-12.6394	-26.9388	-33.7038	-36.7514
190	-12.6421	-26.9416	-33.7067	-36.7541
200	-12.6448	-26.9444	-33.7094	-36.7569
210	-12.6475	-26.9472	-33.7122	-36.7597
220	-12.6501	-26.9499	-33.7149	-36.7624
230	-12.6528	-26.9526	-33.7177	-36.7652
240	-12.6554	-26.9554	-33.7204	-36.7679
250	-12.658	-26.9581	-33.7231	-36.7706
260	-12.6606	-26.9608	-33.7258	-36.7733
270	-12.6632	-26.9635	-33.7285	-36.776
280	-12.6657	-26.9661	-33.7312	-36.7786
290	-12.6683	-26.9688	-33.7338	-36.7813
300	-12.6708	-26.9714	-33.7365	-36.7839
310	-12.6733	-26.974	-33.7391	-36.7865
320	-12.6759	-26.9766	-33.7417	-36.7891
330	-12.6784	-26.9792	-33.7443	-36.7918
340	-12.6809	-26.9818	-33.7469	-36.7944
350	-12.6833	-26.9844	-33.7495	-36.7969
360	-12.6858	-26.9869	-33.7521	-36.7995
370	-12.6882	-26.9895	-33.7546	-36.802
380	-12.6906	-26.992	-33.7572	-36.8046
390	-12.693	-26.9945	-33.7597	-36.8071
400	-12.6954	-26.997	-33.7622	-36.8096
410	-12.6978	-26.9995	-33.7647	-36.8121
420	-12.7002	-27.002	-33.7671	-36.8145
430	-12.7025	-27.0044	-33.7696	-36.817
440	-12.7049	-27.0069	-33.7721	-36.8195
450	-12.7072	-27.0093	-33.7745	-36.8219
460	-12.7095	-27.0117	-33.777	-36.8243
470	-12.7118	-27.0141	-33.7793	-36.8268
480	-12.7141	-27.0165	-33.7818	-36.8291
490	-12.7164	-27.0189	-33.7841	-36.8315
500	-12.7186	-27.0212	-33.7865	-36.8339

Tabelle A.6: Konzentrationsabhängigkeit der Phasenlage beim CO_2 für verschiedene Frequenzen

c(CO_2) [ppm]	4 [Hz]	6 [Hz]	7.3 [Hz]	8 [Hz]
15000	95.448	93.3915	92.0962	91.4825
30000	79.8845	78.7648	78.3491	78.2149
45000	72.0999	70.7011	70.4499	70.4502
60000	67.3934	65.5749	65.2906	65.3184
75000	64.2128	61.9976	61.6192	61.6417
90000	61.8989	59.3405	58.8567	58.8537
105000	60.1239	57.2698	56.6858	56.6543
120000	58.7073	55.6023	54.9264	54.8543
135000	57.5412	54.2173	53.4541	53.3549
150000	56.5628	53.0437	52.1975	52.0687
165000	55.7255	52.0285	51.1164	50.9589
180000	54.9928	51.1448	50.166	49.9766
195000	54.352	50.3661	49.3198	49.1075
210000	53.7759	49.6629	48.5599	48.3247
225000	53.2562	49.027	47.8719	47.6127
240000	52.786	48.4499	47.2413	46.9611
255000	52.3578	47.9203	46.6675	46.3674
270000	51.9699	47.4306	46.1329	45.8139
285000	51.5956	46.9883	45.6379	45.2988
300000	51.2541	46.5516	45.1695	44.82
315000	50.9354	46.1548	44.7339	44.3673
330000	50.6385	45.784	44.3277	43.9445
345000	50.3551	45.4346	43.9428	43.5402
360000	50.0908	45.1005	43.5757	43.1629
375000	49.8399	44.789	43.2291	42.8012
390000	49.6007	44.4882	42.8998	42.4554
405000	49.3756	44.2024	42.5841	42.1272
420000	49.1582	43.9301	42.2842	41.8127
435000	48.9491	43.6682	41.9949	41.5106
450000	48.7522	43.4172	41.7173	41.2209
465000	48.5623	43.1758	41.4496	40.9419
480000	48.3771	42.9443	41.1926	40.6717
495000	48.2006	42.7196	40.9449	40.4152
510000	48.0311	42.5044	40.7036	40.1608
525000	47.8665	42.2946	40.4751	39.9208
540000	47.7074	42.0936	40.2475	39.6848
555000	47.5642	41.9016	40.0328	39.4566
570000	47.4024	41.7099	39.8199	39.2372
585000	47.256	41.5338	39.6157	39.0219
600000	47.1181	41.3429	39.4326	38.8148
615000	46.9815	41.1683	39.227	38.6029
630000	46.8509	41.0003	39.0378	38.4056
645000	46.7199	40.8353	38.8545	38.2114
660000	46.5949	40.6763	38.6727	38.0255
675000	46.4742	40.5175	38.4997	37.8395
690000	46.3539	40.3665	38.3276	37.6626
705000	46.2392	40.2167	38.1623	37.4869
720000	46.1261	40.073	37.9989	37.3168
735000	46.0145	39.9303	37.8413	37.1472
750000	45.9068	39.7932	37.6861	36.9842

Tabelle A.7: Konzentrationsabhängigkeit der Phasenlage beim Grauanteil

Grauanteil [%T]	4 [Hz]	6 [Hz]	7.3 [Hz]	8 [Hz]
0.1	27.6314	15.603	10.0638	7.6274
0.2	27.6312	15.6019	10.0645	7.6271
0.3	27.6276	15.6003	10.0594	7.6212
0.4	27.6305	15.6033	10.0643	7.6278
0.5	27.6288	15.6056	10.0652	7.6288
0.6	27.6284	15.6008	10.0587	7.6205
0.7	27.6477	15.6253	10.061	7.6238
0.8	27.6298	15.6022	10.0637	7.6274
0.9	27.6317	15.6063	10.0634	7.6261
1	27.6293	15.6055	10.0652	7.6279
1.1	27.6277	15.6012	10.0609	7.6263
1.2	27.6274	15.6002	10.0578	7.6215
1.3	27.6295	15.6013	10.0578	7.6212
1.4	27.6484	15.6252	10.0616	7.6238
1.5	27.6291	15.6257	10.0841	7.6483
1.6	27.6301	15.6028	10.0644	7.6273
1.7	27.6304	15.6031	10.0612	7.6249
1.8	27.6324	15.6055	10.0639	7.6258
1.9	27.6324	15.6061	10.0637	7.6271
2	27.6302	15.6059	10.0667	7.6275
2.1	27.6275	15.6064	10.0641	7.6279
2.2	27.6272	15.602	10.0631	7.6276
2.3	27.6272	15.5999	10.0597	7.6218
2.4	27.6276	15.6003	10.059	7.6205
2.5	27.629	15.6004	10.0589	7.6205
2.6	27.6288	15.6018	10.0588	7.6217
2.7	27.6494	15.6029	10.0594	7.6214
2.8	27.6482	15.6247	10.0615	7.6247
2.9	27.631	15.6237	10.0846	7.6237
3	27.6293	15.6248	10.085	7.6491
3.1	27.6295	15.6058	10.0647	7.6475
3.2	27.6306	15.6039	10.0648	7.6262
3.3	27.6309	15.6038	10.0622	7.6256
3.4	27.6322	15.6035	10.0616	7.6236
3.5	27.6316	15.6042	10.0623	7.624
3.6	27.6318	15.6048	10.062	7.6229
3.7	27.6327	15.6062	10.0626	7.6263
3.8	27.6329	15.6051	10.0638	7.6259
3.9	27.6322	15.6053	10.0644	7.6271
4	27.6305	15.6059	10.0643	7.6264
4.1	27.6288	15.6051	10.065	7.6282
4.2	27.6279	15.6063	10.0656	7.6274
4.3	27.6272	15.6051	10.0644	7.6277
4.4	27.6274	15.6024	10.0643	7.6267
4.5	27.6275	15.6009	10.0617	7.625
4.6	27.6277	15.6013	10.06	7.6232
4.7	27.6274	15.6003	10.0582	7.6217
4.8	27.6278	15.5997	10.0579	7.6205
4.9	27.6279	15.6006	10.059	7.6213
5	27.6279	15.601	10.0583	7.6202

Uras-Simulation für das System NO/H_2O/Grau-Fehler:

Gewählte Konzentrationsbereiche: NO von 10 ppm bis 500 ppm (entspricht : 0,001 bis 0.05 Vol.%) H_2O von 700 ppm bis 35000 ppm (entspricht : 0.07 bis 3.5 Vol.%) Grauanteil von 99,9 %T bis 95 %T (entspricht einer Verschmutzung von 0,1 bis 5 %) Frequenzbereich : 4, 6, 7.3 und 8 Hz

Tabelle A.8: Simulationsparameter für das System NO / H_2O / Grauanteil

Strahler	Fenster		Chopper
	Transm.	Refelk.	Freqenz
ir_1	CaF_2	0.05	4 bis 8

Filter					
$Filter_1$	p-Korr	$Filter_2$	p-Korr	$Filter_3$	p-Korr
$F1_{NO}$	1	GF_{N_2O}	0.1	GF_{CO}	0.9

Leck		
l/mm	d/mm	b/(cm^3/s)
0.006	0.055	524

Detektor		Spiegel	Füllgas			
Gas_1	p-Korr	Faktor	Isaentrop.	T.leitf.	dyn.Visk.	Druck
NO	0.9	0.5	1.4	0.19	20	1

Detektorgeometrie									
d_v	d_h	l_v	l_h	Vt_v	Vt_h	dO_v	dO_h	opt-l_v	opt-l_h
1.8	1.8	0.4	1.66	3.1827	2.77	0	0	1	1

Tabelle A.9: Konzentrationsabhängigkeit der Amplitude beim NO für verschiedene Frequenzen

c(NO) [ppm]	4 [Hz]	6 [Hz]	7.3 [Hz]	8 [Hz]
10	4.4249	3.5875	3.1426	2.9366
20	8.8433	7.1697	6.2805	5.8688
30	13.2554	10.7466	9.4137	8.7965
40	17.6611	14.3182	12.5421	11.7199
50	22.0604	17.8844	15.6659	14.6389
60	26.4535	21.4454	18.7851	17.5535
70	30.8401	25.0012	21.8996	20.4637
80	35.2204	28.5517	25.0094	23.3696
90	39.5943	32.0968	28.1146	26.2711
100	43.9621	35.6369	31.2151	29.1681
110	48.3235	39.1717	34.311	32.0609
120	52.6787	42.7011	37.4024	34.9494
130	57.0275	46.2254	40.489	37.8336
140	61.37	49.7446	43.5711	40.7133
150	65.7062	53.2585	46.6486	43.5889
160	70.0364	56.7673	49.7215	46.4601
170	74.3602	60.2707	52.7898	49.3269
180	78.6778	63.7689	55.8536	52.1896
190	82.9891	67.2622	58.9125	55.0477
200	87.2944	70.7504	61.9672	57.9018
210	91.5934	74.2333	65.0172	60.7516
220	95.8864	77.7111	68.0628	63.5972
230	100.173	81.1838	71.1038	66.4383
240	104.4537	84.6511	74.1404	69.2754
250	108.7281	88.1138	77.1722	72.1083
260	112.9961	91.5711	80.1997	74.9368
270	117.2585	95.0235	83.2226	77.761
280	121.5145	98.4706	86.2412	80.5811
290	125.7642	101.9129	89.2552	83.3971
300	130.0079	105.3499	92.2646	86.2089
310	134.2461	108.7818	95.2698	89.0165
320	138.4778	112.2089	98.2704	91.8198
330	142.7032	115.6307	101.2662	94.6188
340	146.9227	119.0476	104.2581	97.4138
350	151.1362	122.4594	107.2454	100.2047
360	155.3438	125.8661	110.2282	102.9914
370	159.5454	129.2683	113.2063	105.7736
380	163.7408	132.6649	116.1802	108.5521
390	167.9301	136.0571	119.1499	111.3263
400	172.114	139.4439	122.115	114.0964
410	176.2914	142.8259	125.0761	116.8626
420	180.463	146.203	128.0323	119.6245
430	184.6288	149.575	130.9842	122.3824
440	188.7884	152.9424	133.9321	125.136
450	192.9422	156.3046	136.8754	127.8855
460	197.0898	159.6617	139.8144	130.6312
470	201.2315	163.0146	142.7487	133.3726
480	205.3677	166.3618	145.6795	136.1099
490	209.4977	169.7048	148.6055	138.8436
500	213.6224	173.0421	151.5268	141.5729

Tabelle A.10: Konzentrationsabhängigkeit der Amplitude beim H_2O für verschiedene Frequenzen

c(H_2O) [ppm]	4 [Hz]	6 [Hz]	7.3 [Hz]	8 [Hz]
700	1.3442	0.9416	0.7883	0.7257
1400	2.6524	1.852	1.5474	1.4232
2100	3.9272	2.7338	2.2797	2.0948
2800	5.171	3.5892	2.9875	2.7426
3500	6.3861	4.4204	3.6727	3.3687
4200	7.5744	5.2293	4.3372	3.9747
4900	8.7377	6.0176	4.9827	4.5624
5600	9.8776	6.7867	5.6105	5.1331
6300	10.9956	7.5381	6.222	5.688
7000	12.0932	8.273	6.8184	6.2285
7700	13.1714	8.9925	7.4008	6.7554
8400	14.2314	9.6977	7.9702	7.2699
9100	15.2743	10.3896	8.5275	7.7728
9800	16.301	11.0689	9.0734	8.2649
10500	17.3123	11.7365	9.6089	8.7468
11200	18.3092	12.3931	10.1344	9.2194
11900	19.2921	13.0393	10.6507	9.6832
12600	20.2621	13.6758	11.1584	10.1386
13300	21.2196	14.3029	11.6578	10.5864
14000	22.1652	14.9214	12.1497	11.0269
14700	23.0995	15.5316	12.6342	11.4605
15400	24.0228	16.1341	13.1119	11.8877
16100	24.9357	16.729	13.5832	12.3088
16800	25.8389	17.3169	14.0483	12.7241
17500	26.7323	17.898	14.5077	13.134
18200	27.6167	18.4728	14.9615	13.5387
18900	28.492	19.0413	15.4101	13.9384
19600	29.3591	19.6041	15.8537	14.3336
20300	30.218	20.1612	16.2925	14.7243
21000	31.0691	20.7128	16.7268	15.1107
21700	31.9126	21.2594	17.1567	15.4931
22400	32.7486	21.801	17.5825	15.8717
23100	33.5774	22.3378	18.0043	16.2466
23800	34.3996	22.87	18.4223	16.618
24500	35.2148	23.3977	18.8365	16.986
25200	36.0238	23.9213	19.2473	17.3507
25900	36.8262	24.4406	19.6546	17.7123
26600	37.6229	24.9559	20.0587	18.0709
27300	38.4133	25.4673	20.4596	18.4266
28000	39.1979	25.975	20.8575	18.7795
28700	39.9769	26.479	21.2523	19.1297
29400	40.7508	26.9795	21.6444	19.4773
30100	41.5189	27.4766	22.0337	19.8224
30800	42.2819	27.9702	22.4202	20.165
31500	43.0401	28.4606	22.8041	20.5053
32200	43.7928	28.9479	23.1856	20.8433
32900	44.5409	29.4321	23.5645	21.1791
33600	45.2843	29.9131	23.941	21.5127
34300	46.0228	30.3913	24.3152	21.8442
35000	46.7571	30.8667	24.6871	22.1736

Tabelle A.11: Konzentrationsabhängigkeit der Amplitude beim Grauanteil

Grauanteil [%T]	4 [Hz]	6 [Hz]	7.3 [Hz]	8 [Hz]
0.1	2.6502	1.9005	1.5712	1.4295
0.2	5.2975	3.799	3.1408	2.8576
0.3	7.9422	5.6955	4.7087	4.2841
0.4	10.5844	7.5903	6.2752	5.7094
0.5	13.2236	9.4831	7.8402	7.1332
0.6	15.8604	11.3739	9.4033	8.5553
0.7	18.4946	13.2631	10.9652	9.9764
0.8	21.1261	15.1502	12.5253	11.3959
0.9	23.7549	17.0354	14.0839	12.8137
1	26.3807	18.9186	15.641	14.2305
1.1	29.0047	20.7998	17.1962	15.6455
1.2	31.6255	22.6794	18.7502	17.0593
1.3	34.2441	24.5568	20.3023	18.4715
1.4	36.8597	26.4332	21.8535	19.8827
1.5	39.4724	28.3068	23.4024	21.2921
1.6	42.083	30.1791	24.9504	22.7004
1.7	44.6909	32.0488	26.4964	24.1074
1.8	47.2959	33.9172	28.0409	25.5123
1.9	49.8986	35.7838	29.584	26.9161
2	52.4979	37.648	31.1254	28.3188
2.1	55.0951	39.5101	32.6656	29.7199
2.2	57.6901	41.3709	34.2034	31.1191
2.3	60.2821	43.23	35.7397	32.5169
2.4	62.8715	45.0871	37.2752	33.914
2.5	65.4578	46.9416	38.8092	35.3095
2.6	68.0432	48.795	40.3411	36.7034
2.7	70.625	50.6472	41.8723	38.0965
2.8	73.2041	52.4967	43.4018	39.4878
2.9	75.7807	54.3444	44.9289	40.8773
3	78.3548	56.1905	46.4554	42.2661
3.1	80.9259	58.0347	47.9804	43.6527
3.2	83.4952	59.8763	49.5022	45.0386
3.3	86.0612	61.717	51.024	46.423
3.4	88.625	63.555	52.5443	47.8057
3.5	91.1855	65.3918	54.0621	49.1872
3.6	93.7439	67.2265	55.5791	50.5675
3.7	96.3003	69.0592	57.0943	51.9458
3.8	98.8533	70.89	58.6081	53.3233
3.9	101.404	72.7198	60.1203	54.6992
4	103.9507	74.5476	61.6314	56.0741
4.1	106.4958	76.3726	63.1405	57.4468
4.2	109.0395	78.1952	64.6485	58.8187
4.3	111.5797	80.0172	66.1543	60.189
4.4	114.119	81.8375	67.6585	61.5573
4.5	116.654	83.6551	69.1613	62.9251
4.6	119.1857	85.4715	70.6629	64.2909
4.7	121.7161	87.2861	72.1636	65.6559
4.8	124.2443	89.099	73.6619	67.019
4.9	126.7696	90.9101	75.1595	68.3812
5	129.2917	92.7189	76.6557	69.743

Tabelle A.12: Konzentrationsabhängigkeit der Phasenlage beim NO für verschiedene Frequenzen

c(NO) [ppm]	4 [Hz]	6 [Hz]	7.3 [Hz]	8 [Hz]
10	-18.3075	-32.796	-39.3368	-42.2238
20	-18.3074	-32.796	-39.3368	-42.2239
30	-18.3074	-32.796	-39.3368	-42.2239
40	-18.3074	-32.7961	-39.3369	-42.224
50	-18.3073	-32.7961	-39.337	-42.224
60	-18.3073	-32.7961	-39.337	-42.2241
70	-18.3073	-32.7961	-39.337	-42.2241
80	-18.3073	-32.7962	-39.3371	-42.2242
90	-18.3073	-32.7962	-39.3371	-42.2242
100	-18.3072	-32.7962	-39.3371	-42.2242
110	-18.3072	-32.7962	-39.3372	-42.2243
120	-18.3072	-32.7962	-39.3372	-42.2243
130	-18.3072	-32.7962	-39.3373	-42.2244
140	-18.3071	-32.7963	-39.3373	-42.2244
150	-18.3071	-32.7963	-39.3373	-42.2245
160	-18.3071	-32.7963	-39.3374	-42.2245
170	-18.3071	-32.7963	-39.3374	-42.2245
180	-18.307	-32.7964	-39.3375	-42.2246
190	-18.307	-32.7964	-39.3375	-42.2246
200	-18.307	-32.7964	-39.3375	-42.2247
210	-18.3069	-32.7964	-39.3375	-42.2247
220	-18.3069	-32.7964	-39.3376	-42.2248
230	-18.3069	-32.7964	-39.3376	-42.2248
240	-18.3068	-32.7964	-39.3376	-42.2248
250	-18.3068	-32.7965	-39.3377	-42.2249
260	-18.3068	-32.7965	-39.3377	-42.2249
270	-18.3067	-32.7965	-39.3377	-42.2249
280	-18.3067	-32.7965	-39.3378	-42.225
290	-18.3066	-32.7965	-39.3378	-42.225
300	-18.3066	-32.7965	-39.3378	-42.2251
310	-18.3066	-32.7965	-39.3378	-42.2251
320	-18.3066	-32.7966	-39.3379	-42.2251
330	-18.3065	-32.7966	-39.3379	-42.2251
340	-18.3065	-32.7966	-39.3379	-42.2252
350	-18.3064	-32.7966	-39.338	-42.2252
360	-18.3064	-32.7966	-39.338	-42.2252
370	-18.3063	-32.7966	-39.338	-42.2253
380	-18.3063	-32.7966	-39.338	-42.2253
390	-18.3062	-32.7966	-39.338	-42.2253
400	-18.3062	-32.7966	-39.3381	-42.2254
410	-18.3062	-32.7966	-39.3381	-42.2254
420	-18.3061	-32.7966	-39.3381	-42.2254
430	-18.306	-32.7966	-39.3381	-42.2254
440	-18.306	-32.7966	-39.3381	-42.2255
450	-18.306	-32.7966	-39.3382	-42.2255
460	-18.3059	-32.7966	-39.3382	-42.2255
470	-18.3058	-32.7966	-39.3382	-42.2255
480	-18.3058	-32.7966	-39.3382	-42.2256
490	-18.3058	-32.7966	-39.3382	-42.2256
500	-18.3057	-32.7966	-39.3382	-42.2256

Tabelle A.13: Konzentrationsabhängigkeit der Phasenlage beim H_2O für verschiedene Frequenzen

c(H_2O) [ppm]	4 [Hz]	6 [Hz]	7.3 [Hz]	8 [Hz]
700	56.7592	57.5646	58.9104	59.7295
1400	56.0889	56.7647	58.0852	58.9032
2100	55.4434	55.99	57.2837	58.0935
2800	54.8198	55.2382	56.4989	57.3079
3500	54.2187	54.5071	55.7367	56.5373
4200	53.6394	53.7998	54.9924	55.7851
4900	53.0791	53.112	54.27	55.0546
5600	52.5385	52.4441	53.5639	54.3406
6300	52.0165	51.7959	52.8766	53.6421
7000	51.511	51.1671	52.208	52.9618
7700	51.0237	50.5553	51.5558	52.2977
8400	50.5516	49.9617	50.9211	51.6485
9100	50.0948	49.3847	50.3016	51.0171
9800	49.6526	48.8248	49.6992	50.4016
10500	49.2248	48.2799	49.1122	49.7975
11200	48.8087	47.7497	48.5378	49.211
11900	48.4071	47.2343	47.9796	48.6373
12600	48.0165	46.7317	47.4353	48.0764
13300	47.6375	46.245	46.9036	47.5286
14000	47.2695	45.7709	46.385	46.9958
14700	46.9118	45.3066	45.8789	46.4739
15400	46.5661	44.8561	45.3855	45.9643
16100	46.2293	44.4176	44.9042	45.4662
16800	45.9009	43.9912	44.4347	44.9789
17500	45.5822	43.5731	43.9748	44.5043
18200	45.2719	43.1658	43.5271	44.0395
18900	44.9711	42.7707	43.088	43.5839
19600	44.6766	42.3839	42.6596	43.1384
20300	44.3898	42.0064	42.2421	42.7044
21000	44.1102	41.6384	41.8326	42.2785
21700	43.8379	41.2794	41.4345	41.8615
22400	43.5719	40.927	41.0419	41.4546
23100	43.3142	40.5844	40.6576	41.0563
23800	43.0606	40.2492	40.2851	40.665
24500	42.8151	39.922	39.919	40.2835
25200	42.5734	39.6008	39.5624	39.9078
25900	42.3394	39.2885	39.2103	39.5416
26600	42.109	38.9825	38.8689	39.1832
27300	41.8849	38.6827	38.5321	38.8317
28000	41.6665	38.3897	38.203	38.4877
28700	41.4526	38.104	37.8808	38.149
29400	41.2424	37.8229	37.5658	37.8183
30100	41.0381	37.5481	37.2549	37.4935
30800	40.8381	37.2807	36.9537	37.1763
31500	40.6412	37.0176	36.6574	36.864
32200	40.4505	36.7607	36.3648	36.5589
32900	40.2628	36.5077	36.0807	36.2583
33600	40.0788	36.2607	35.802	35.9632
34300	39.8993	36.0191	35.5269	35.6767
35000	39.7225	35.7804	35.2585	35.3944

Tabelle A.14: Konzentrationsabhängigkeit der Phasenlage beim Grauanteil

Grauanteil [%T]	4 [Hz]	6 [Hz]	7.3 [Hz]	8 [Hz]
0.1	2.8281	-11.4488	-17.953	-20.8382
0.2	2.8283	-11.4486	-17.9526	-20.8382
0.3	2.8285	-11.4484	-17.9523	-20.8373
0.4	2.828	-11.4487	-17.9527	-20.838
0.5	2.8289	-11.4484	-17.9528	-20.838
0.6	2.8286	-11.4484	-17.9523	-20.8376
0.7	2.8285	-11.4487	-17.9528	-20.8381
0.8	2.8285	-11.4487	-17.9527	-20.8383
0.9	2.8284	-11.4487	-17.9528	-20.8376
1	2.829	-11.4486	-17.953	-20.838
1.1	2.8285	-11.4481	-17.9525	-20.8375
1.2	2.8286	-11.4482	-17.9525	-20.8375
1.3	2.8281	-11.4481	-17.9523	-20.8375
1.4	2.8282	-11.4488	-17.9529	-20.8379
1.5	2.8285	-11.4487	-17.9525	-20.8378
1.6	2.8283	-11.4488	-17.9529	-20.8381
1.7	2.8283	-11.4483	-17.9527	-20.8384
1.8	2.8284	-11.4485	-17.9527	-20.838
1.9	2.8284	-11.4487	-17.9527	-20.8378
2	2.8287	-11.4485	-17.9527	-20.8382
2.1	2.8288	-11.448	-17.9531	-20.8382
2.2	2.8286	-11.4482	-17.9525	-20.8378
2.3	2.8288	-11.4483	-17.952	-20.8373
2.4	2.8286	-11.4485	-17.9523	-20.8376
2.5	2.829	-11.448	-17.9525	-20.8378
2.6	2.8284	-11.4481	-17.9523	-20.8377
2.7	2.8284	-11.4486	-17.9527	-20.838
2.8	2.8284	-11.4486	-17.953	-20.8381
2.9	2.8284	-11.4487	-17.9526	-20.8378
3	2.8283	-11.4487	-17.9529	-20.8381
3.1	2.8284	-11.4489	-17.9534	-20.8378
3.2	2.8282	-11.4486	-17.9525	-20.838
3.3	2.8282	-11.4488	-17.9528	-20.8381
3.4	2.8282	-11.4485	-17.953	-20.8379
3.5	2.8284	-11.4487	-17.9527	-20.838
3.6	2.8284	-11.4487	-17.9528	-20.8382
3.7	2.8283	-11.4485	-17.9527	-20.8379
3.8	2.8284	-11.4484	-17.9526	-20.8381
3.9	2.8284	-11.4487	-17.9526	-20.838
4	2.8289	-11.4489	-17.9527	-20.8382
4.1	2.829	-11.4487	-17.9527	-20.8379
4.2	2.8288	-11.4482	-17.9528	-20.838
4.3	2.829	-11.4482	-17.9526	-20.8379
4.4	2.8285	-11.4484	-17.9524	-20.8375
4.5	2.8287	-11.4481	-17.9521	-20.8377
4.6	2.829	-11.4481	-17.9521	-20.8374
4.7	2.8289	-11.4482	-17.9524	-20.8375
4.8	2.8288	-11.4482	-17.9522	-20.8372
4.9	2.8288	-11.4482	-17.9524	-20.8373
5	2.8289	-11.4481	-17.9526	-20.8378

Uras-Simulation für das System SO_2/H_2O/Grau-Fehler:

Gewählte Konzentrationsbereiche: SO_2 von 10 ppm bis 500 ppm (entspricht : 0,001 bis 0.05 Vol.%) H_2O von 700 ppm bis 35000 ppm (entspricht : 0.07 bis 3.5 Vol.%) Grauanteil von 99,9 %T bis 95 %T (entspricht einer Verschmutzung von 0,1 bis 5 %) Frequenzbereich : 4, 6, 7.3 und 8 Hz

Tabelle A.15: Simulationsparameter für das System SO_2 / H_2O / Grauanteil

Strahler	Filter		Fenster		Chopper
	$Filter_1$	p-Korr	Transm.	Refelk.	Freqenz
ir_1	$F1_{SO_2}$	1	CaF_2	0.05	4 bis 8

Leck			Spiegel
l/mm	d/mm	b/(cm^3/s)	Faktor
0.006	0.055	524	1

Detektor				Füllgas			
Gas_1	p-Korr	Gas_2	p-Korr	Isaentrop.	T.leitf.	dyn.Visk.	Druck
SO_2	1.33	C_2H_4	1.0	1.4	0.19	20	1

Detektorgeometrie									
d_v	d_h	l_v	l_h	Vt_v	Vt_h	dO_v	dO_h	opt-l_v	opt-l_h
1.8	1.8	0.4	1.66	3.1827	2.4	0	0	1	1

Tabelle A.16: Konzentrationsabhängigkeit der Amplitude beim SO_2 für verschiedene Frequenzen

c(SO_2) [ppm]	4 [Hz]	6 [Hz]	7.3 [Hz]	8 [Hz]
10	35.8671	29.5581	24.4068	24.4068
20	71.622	59.0226	48.7357	48.7357
30	107.2645	88.3934	72.9869	72.9869
40	142.7969	117.6724	97.1618	97.1618
50	178.2159	146.8569	121.2583	121.2583
60	213.5266	175.9508	145.2792	145.2792
70	248.7263	204.9533	169.2241	169.2241
80	283.8163	233.8637	193.0931	193.0931
90	318.7977	262.6828	216.8858	216.8858
100	353.6647	291.4083	240.6007	240.6007
110	388.427	320.0455	264.2428	264.2428
120	423.0819	348.593	287.8093	287.8093
130	457.6276	377.0504	311.3014	311.3014
140	492.0664	405.4174	334.7189	334.7189
150	526.3976	433.6946	358.0626	358.0626
160	560.621	461.8852	381.3317	381.3317
170	594.7392	489.9856	404.5278	404.5278
180	628.7518	517.9973	427.6492	427.6492
190	662.6569	545.9208	450.6983	450.6983
200	696.449	573.7497	473.674	473.674
210	730.1432	601.4982	496.5724	496.5724
220	763.7332	629.159	519.4019	519.4019
230	797.2192	656.733	542.16	542.16
240	830.6012	684.2197	564.8463	564.8463
250	863.8782	711.6206	587.4612	587.4612
260	897.0534	738.9365	610.0042	610.0042
270	930.1241	766.1644	632.4755	632.4755
280	963.0943	793.3074	654.877	654.877
290	995.9623	820.3657	677.2079	677.2079
300	1028.7255	847.3399	699.4667	699.4667
310	1061.3894	874.2297	721.6558	721.6558
320	1093.9517	901.0336	743.7755	743.7755
330	1126.4113	927.7532	765.8253	765.8253
340	1158.7714	954.3898	787.8049	787.8049
350	1191.0337	980.9459	809.7147	809.7147
360	1223.1948	1007.4138	831.5575	831.5575
370	1255.2544	1033.7999	853.3304	853.3304
380	1287.2174	1060.1049	875.0338	875.0338
390	1319.0808	1086.3292	896.6696	896.6696
400	1350.8273	1112.4692	918.238	918.238
410	1382.4919	1138.5143	939.7391	939.7391
420	1414.0604	1164.4923	961.1585	961.1585
430	1445.5303	1190.386	982.5247	982.5247
440	1476.9039	1216.2021	1003.822	1003.822
450	1508.1792	1241.936	1025.0515	1025.0515
460	1539.3617	1267.5889	1046.2148	1046.2148
470	1570.4443	1293.161	1067.3126	1067.3126
480	1601.434	1318.6577	1088.343	1088.343
490	1632.3243	1344.0713	1109.3085	1109.3085
500	1663.1212	1369.4094	1130.2083	1130.2083

Tabelle A.17: Konzentrationsabhängigkeit der Amplitude beim H_2O für verschiedene Frequenzen

c(H_2O) [ppm]	4 [Hz]	6 [Hz]	7.3 [Hz]	8 [Hz]
700	5.803	4.4021	3.7759	3.5035
1400	11.2734	8.4913	7.2555	6.72
2100	16.4647	12.3173	10.4848	9.6932
2800	21.4219	15.9225	13.5038	12.4617
3500	26.1837	19.3436	16.346	15.0576
4200	30.7822	22.6117	19.0417	17.5101
4900	35.2448	25.7538	21.6157	19.8437
5600	39.5946	28.7923	24.0902	22.0792
6300	43.8511	31.7464	26.4837	24.2347
7000	48.0302	34.6326	28.812	26.3266
7700	52.1458	37.4646	31.0885	28.3676
8400	56.2091	40.2541	33.3251	30.3691
9100	60.2296	43.0105	35.5311	32.3409
9800	64.2151	45.742	37.7144	34.2906
10500	68.1723	48.4553	39.8821	36.2252
11200	72.1059	51.1555	42.0395	38.1502
11900	76.0218	53.8479	44.1912	40.0701
12600	79.9218	56.5352	46.3409	41.9888
13300	83.8102	59.2209	48.4915	43.9094
14000	87.6884	61.9068	50.6455	45.834
14700	91.5584	64.5948	52.8048	47.7645
15400	95.4222	67.2873	54.9701	49.7026
16100	99.281	69.9839	57.1435	51.6492
16800	103.1351	72.6862	59.3252	53.6051
17500	106.9852	75.3935	61.5152	55.5708
18200	110.8324	78.1075	63.7145	57.5465
18900	114.6762	80.8275	65.923	59.5323
19600	118.5174	83.5539	68.1411	61.5281
20300	122.3546	86.2862	70.3673	63.5338
21000	126.1897	89.0241	72.6022	65.5497
21700	130.0215	91.7678	74.8457	67.5741
22400	133.8511	94.5165	77.0969	69.6078
23100	137.6764	97.2694	79.3561	71.6506
23800	141.4984	100.0269	81.621	73.7009
24500	145.3169	102.7879	83.8936	75.7585
25200	149.1319	105.5549	86.1719	77.823
25900	152.9406	108.3218	88.4569	79.8952
26600	156.7455	111.0923	90.7457	81.9728
27300	160.5452	113.8644	93.0394	84.0559
28000	164.3411	116.6394	95.3364	86.1441
28700	168.1299	119.4151	97.6389	88.2366
29400	171.9148	122.1906	99.9431	90.334
30100	175.6901	124.9663	102.2503	92.4325
30800	179.4616	127.7432	104.5591	94.5375
31500	183.2262	130.5177	106.8691	96.6421
32200	186.9826	133.2928	109.1825	98.7521
32900	190.7328	136.0661	111.4961	100.8619
33600	194.4759	138.839	113.8111	102.9748
34300	198.2111	141.6083	116.1245	105.0862
35000	201.9384	144.3748	118.4382	107.2015

Tabelle A.18: Konzentrationsabhängigkeit der Amplitude beim Grauanteil

Grauanteil [%T]	4 [Hz]	6 [Hz]	7.3 [Hz]	8 [Hz]
0.1	8.7806	6.7298	5.7376	5.294
0.2	17.552	13.4524	11.469	10.5824
0.3	26.3145	20.1681	17.1947	15.8656
0.4	35.0682	26.8775	22.9149	21.1436
0.5	43.8134	33.5802	28.629	26.4158
0.6	52.5497	40.276	34.3376	31.6832
0.7	61.278	46.9654	40.041	36.9454
0.8	69.9963	53.6475	45.7377	42.2022
0.9	78.706	60.3231	51.4289	47.4532
1	87.4064	66.9916	57.1141	52.6994
1.1	96.0998	73.6537	62.7945	57.9406
1.2	104.7839	80.3102	68.4692	63.1768
1.3	113.4592	86.9583	74.1374	68.4067
1.4	122.1256	93.6016	79.8007	73.6316
1.5	130.7821	100.2368	85.4572	78.8516
1.6	139.4323	106.8649	91.1102	84.0663
1.7	148.0718	113.4861	96.755	89.2756
1.8	156.7025	120.1017	102.3945	94.48
1.9	165.3249	126.7111	108.0287	99.6773
2	173.937	133.3128	113.6579	104.8717
2.1	182.5465	139.9095	119.2816	110.0608
2.2	191.1419	146.4981	124.8993	115.2432
2.3	199.7315	153.0802	130.5106	120.4213
2.4	208.3094	159.6569	136.1176	125.5944
2.5	216.8829	166.2262	141.719	130.7615
2.6	225.4419	172.789	147.3134	135.9252
2.7	233.9981	179.3466	152.9015	141.0832
2.8	242.5426	185.8941	158.4881	146.2349
2.9	251.0804	192.4381	164.0636	151.3814
3	259.609	198.9726	169.6387	156.5233
3.1	268.1274	205.5034	175.2037	161.6588
3.2	276.6382	212.0263	180.7652	166.7913
3.3	285.14	218.5416	186.3196	171.9179
3.4	293.6349	225.0531	191.8717	177.0366
3.5	302.1169	231.5558	197.4165	182.1526
3.6	310.5947	238.0541	202.955	187.2644
3.7	319.0622	244.5426	208.4881	192.3707
3.8	327.5207	251.0258	214.0141	197.4726
3.9	335.9752	257.504	219.5363	202.5665
4	344.416	263.9748	225.0538	207.6561
4.1	352.8508	270.4391	230.5668	212.7417
4.2	361.2768	276.8942	236.0696	217.8219
4.3	369.6955	283.3488	241.5729	222.8962
4.4	378.1048	289.7906	247.0629	227.9672
4.5	386.5025	296.2281	252.5543	233.029
4.6	394.8989	302.6639	258.0368	238.0923
4.7	403.2799	309.089	263.516	243.1471
4.8	411.6583	315.5107	268.9897	248.1948
4.9	420.0237	321.9205	274.4559	253.2403
5	428.3844	328.3299	279.9203	258.2796

Tabelle A.19: Konzentrationsabhängigkeit der Phasenlage beim SO_2 für verschiedene Frequenzen

c(SO_2) [ppm]	4 [Hz]	6 [Hz]	7.3 [Hz]	8 [Hz]
10	-18.3085	-32.7818	-42.2616	-42.2616
20	-18.3089	-32.7822	-42.262	-42.262
30	-18.3092	-32.7826	-42.2624	-42.2624
40	-18.3096	-32.783	-42.2628	-42.2628
50	-18.31	-32.7833	-42.2632	-42.2632
60	-18.3104	-32.7838	-42.2636	-42.2636
70	-18.3108	-32.7842	-42.264	-42.264
80	-18.3112	-32.7846	-42.2644	-42.2644
90	-18.3116	-32.785	-42.2648	-42.2648
100	-18.3119	-32.7853	-42.2651	-42.2651
110	-18.3123	-32.7857	-42.2655	-42.2655
120	-18.3127	-32.7861	-42.2659	-42.2659
130	-18.3131	-32.7865	-42.2663	-42.2663
140	-18.3134	-32.7869	-42.2667	-42.2667
150	-18.3138	-32.7873	-42.2671	-42.2671
160	-18.3142	-32.7877	-42.2675	-42.2675
170	-18.3146	-32.7881	-42.2679	-42.2679
180	-18.315	-32.7885	-42.2683	-42.2683
190	-18.3153	-32.7889	-42.2687	-42.2687
200	-18.3156	-32.7891	-42.2691	-42.2691
210	-18.316	-32.7895	-42.2693	-42.2693
220	-18.3164	-32.7899	-42.2697	-42.2697
230	-18.3167	-32.7903	-42.2701	-42.2701
240	-18.3171	-32.7907	-42.2705	-42.2705
250	-18.3175	-32.7911	-42.2708	-42.2708
260	-18.3178	-32.7915	-42.2712	-42.2712
270	-18.3182	-32.7918	-42.2716	-42.2716
280	-18.3185	-32.7922	-42.272	-42.272
290	-18.3189	-32.7926	-42.2724	-42.2724
300	-18.3193	-32.793	-42.2727	-42.2727
310	-18.3196	-32.7934	-42.2731	-42.2731
320	-18.32	-32.7937	-42.2735	-42.2735
330	-18.3203	-32.7941	-42.2738	-42.2738
340	-18.3207	-32.7944	-42.2742	-42.2742
350	-18.321	-32.7948	-42.2746	-42.2746
360	-18.3214	-32.7952	-42.2749	-42.2749
370	-18.3217	-32.7955	-42.2753	-42.2753
380	-18.3221	-32.7959	-42.2756	-42.2756
390	-18.3224	-32.7962	-42.276	-42.276
400	-18.3227	-32.7966	-42.2763	-42.2763
410	-18.323	-32.7968	-42.2767	-42.2767
420	-18.3233	-32.7972	-42.277	-42.277
430	-18.3237	-32.7976	-42.2773	-42.2773
440	-18.324	-32.7979	-42.2776	-42.2776
450	-18.3243	-32.7983	-42.278	-42.278
460	-18.3247	-32.7986	-42.2783	-42.2783
470	-18.325	-32.799	-42.2787	-42.2787
480	-18.3254	-32.7993	-42.279	-42.279
490	-18.3257	-32.7997	-42.2794	-42.2794
500	-18.326	-32.8	-42.2797	-42.2797

Tabelle A.20: Konzentrationsabhängigkeit der Phasenlage beim H_2O für verschiedene Frequenzen

c(H_2O) [ppm]	4 [Hz]	6 [Hz]	7.3 [Hz]	8 [Hz]
700	79.0861	74.352	72.7909	72.2651
1400	76.9602	72.104	70.5397	70.0273
2100	74.8859	69.8799	68.2946	67.787
2800	72.8649	67.6845	66.066	65.5552
3500	70.9028	65.5258	63.8545	63.333
4200	68.9988	63.4073	61.6717	61.131
4900	67.1552	61.3355	59.5198	58.9552
5600	65.3735	59.3115	57.4062	56.8091
6300	63.6522	57.3383	55.3335	54.696
7000	61.9917	55.4205	53.3075	52.627
7700	60.3917	53.558	51.328	50.6011
8400	58.8502	51.7535	49.4019	48.6227
9100	57.3674	50.0068	47.5306	46.6951
9800	55.9413	48.3154	45.7108	44.8195
10500	54.5682	46.6848	43.9495	42.9974
11200	53.2503	45.1111	42.2444	41.2318
11900	51.9797	43.5906	40.5944	39.5192
12600	50.762	42.1278	38.9993	37.8632
13300	49.5894	40.7167	37.4616	36.2607
14000	48.4631	39.3604	35.977	34.7151
14700	47.3805	38.0544	34.5448	33.2246
15400	46.3393	36.7953	33.1685	31.784
16100	45.3369	35.5853	31.8383	30.397
16800	44.373	34.4195	30.5591	29.0605
17500	43.4457	33.2998	29.3278	27.7723
18200	42.5522	32.2208	28.1419	26.5316
18900	41.6921	31.1823	26.9998	25.3367
19600	40.8633	30.1826	25.8989	24.1864
20300	40.0656	29.2195	24.8405	23.0789
21000	39.2958	28.2924	23.8213	22.0106
21700	38.5533	27.399	22.8392	20.9837
22400	37.8363	26.5378	21.8927	19.9934
23100	37.1448	25.7085	20.9803	19.0383
23800	36.477	24.9085	20.1029	18.1189
24500	35.8316	24.137	19.2554	17.2333
25200	35.2075	23.3897	18.4383	16.3791
25900	34.6054	22.6717	17.6486	15.5542
26600	34.022	21.977	16.888	14.7586
27300	33.4581	21.3064	16.1534	13.991
28000	32.9111	20.6568	15.4448	13.2497
28700	32.3824	20.0295	14.7582	12.5343
29400	31.869	19.4237	14.0963	11.8425
30100	31.3733	18.8373	13.4558	11.1762
30800	30.8915	18.2687	12.8369	10.5286
31500	30.424	17.7194	12.2386	9.9053
32200	29.971	17.1863	11.6578	9.2993
32900	29.5309	16.6701	11.0962	8.7144
33600	29.1032	16.1689	10.5515	8.1471
34300	28.6881	15.6839	10.0253	7.5997
35000	28.2849	15.2137	9.5145	7.0666

Tabelle A.21: Konzentrationsabhängigkeit der Phasenlage beim Grauanteil

Grauanteil [%T]	4 [Hz]	6 [Hz]	7.3 [Hz]	8 [Hz]
0.1	-3.5301	-18.7805	-25.7398	-28.831
0.2	-3.5304	-18.7805	-25.7396	-28.8309
0.3	-3.5303	-18.7803	-25.7396	-28.831
0.4	-3.5301	-18.7804	-25.7397	-28.831
0.5	-3.5301	-18.7804	-25.7395	-28.8305
0.6	-3.5303	-18.7806	-25.7397	-28.8309
0.7	-3.5304	-18.7806	-25.7398	-28.8308
0.8	-3.5303	-18.7805	-25.7396	-28.8309
0.9	-3.5303	-18.7806	-25.7395	-28.8307
1	-3.53	-18.7804	-25.7394	-28.8307
1.1	-3.5303	-18.7804	-25.7396	-28.8309
1.2	-3.5303	-18.7806	-25.7398	-28.8311
1.3	-3.5304	-18.7805	-25.7397	-28.831
1.4	-3.5304	-18.7807	-25.7398	-28.8309
1.5	-3.5302	-18.7807	-25.7396	-28.831
1.6	-3.5304	-18.7804	-25.7399	-28.8309
1.7	-3.5302	-18.7802	-25.7396	-28.8309
1.8	-3.5302	-18.7803	-25.7395	-28.8309
1.9	-3.5301	-18.7804	-25.7395	-28.8305
2	-3.5298	-18.7803	-25.7396	-28.8307
2.1	-3.5303	-18.7805	-25.7396	-28.8309
2.2	-3.5302	-18.7806	-25.7397	-28.8307
2.3	-3.5303	-18.7804	-25.7396	-28.8308
2.4	-3.5301	-18.7806	-25.7398	-28.8309
2.5	-3.5304	-18.7806	-25.7399	-28.8307
2.6	-3.5299	-18.7806	-25.7398	-28.8309
2.7	-3.5302	-18.7808	-25.7396	-28.831
2.8	-3.5301	-18.7806	-25.74	-28.831
2.9	-3.5303	-18.7807	-25.7396	-28.8309
3	-3.5303	-18.7805	-25.7399	-28.8308
3.1	-3.5302	-18.7806	-25.7397	-28.8308
3.2	-3.5302	-18.7806	-25.7397	-28.8309
3.3	-3.5301	-18.7804	-25.7395	-28.8309
3.4	-3.5302	-18.7806	-25.7397	-28.8306
3.5	-3.53	-18.7805	-25.7398	-28.8306
3.6	-3.5301	-18.7807	-25.7397	-28.8307
3.7	-3.53	-18.7805	-25.7397	-28.8308
3.8	-3.53	-18.7804	-25.7395	-28.831
3.9	-3.5302	-18.7805	-25.7395	-28.8308
4	-3.53	-18.7805	-25.7395	-28.8307
4.1	-3.5301	-18.7805	-25.7397	-28.8308
4.2	-3.53	-18.7803	-25.7395	-28.8308
4.3	-3.5302	-18.7806	-25.7397	-28.8307
4.4	-3.5302	-18.7803	-25.7394	-28.8308
4.5	-3.53	-18.7802	-25.7395	-28.8305
4.6	-3.5303	-18.7805	-25.7394	-28.8308
4.7	-3.5302	-18.7805	-25.7395	-28.8309
4.8	-3.5303	-18.7807	-25.7396	-28.8307
4.9	-3.5302	-18.7805	-25.7395	-28.8308
5	-3.5303	-18.7807	-25.7397	-28.8308