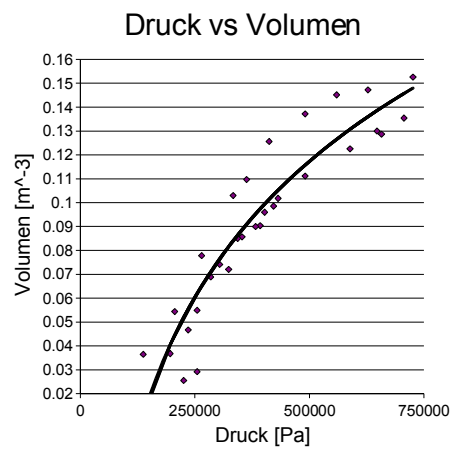


Ballon Volumen vs Druck

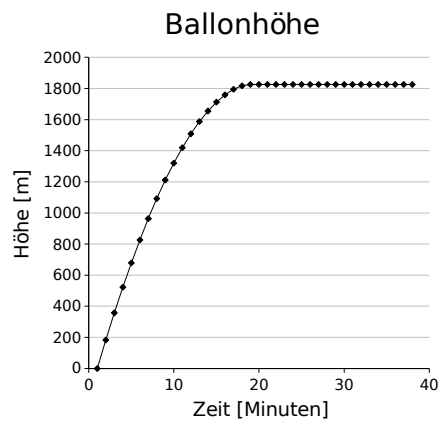
rho_wasser 1000 kg m⁻³
g 9.81 m s⁻²
Wassersäule 14 mm
Ballon – Massstab 950 mm
Lampe – Ballon 2750 mm
Total 3700 mm

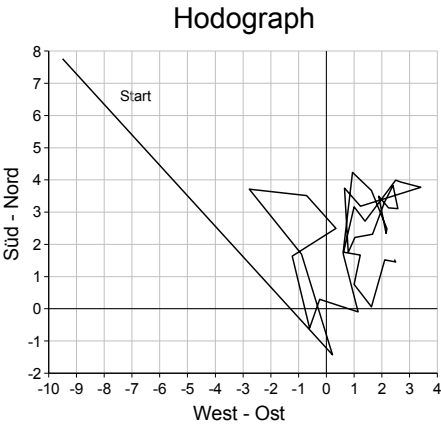
Messung	Wassersäule [mm]		Kontrolle dWSDruck [Pa]	Durchmesser gemessen [mm] +/- 5			Radius korrigiert [mm]		Volumen [m³]	y=bm*x		Berechnete Werte		
	Unten	Oben		1	2	3	1	2		3	m		b	
1.0	55	81	26	657270	845	770	920	314.02	286.15	341.89	0.128685	1.000002553	0.030022980	0.160768
1.1	32	58	26	431640	790	740	810	293.58	275	301.01	0.101797	0.000000316	0.136133185	0.090372
1.2	30	55	25	402210	775	720	800	288.01	267.57	297.3	0.095966	0.700187079	0.275976122	0.083831
1.3	29	54	25	392400	765	700	785	284.29	260.14	291.72	0.090369	65.391572119	28.000000000	0.081757
1.4	24	50	26	353160	755	690	765	280.57	256.42	284.29	0.085674	4.980406524	2.132558955	0.073964
1.5	23	49	26	343350	745	685	775	276.86	254.56	288.01	0.085024			0.072134
1.6	19	45	26	304110	725	665	715	269.43	247.13	265.71	0.074107			0.065258
1.7	17	43	26	284490	720	640	695	267.57	237.84	258.28	0.068848			0.062070
1.8	14	40	26	255060	655	600	650	243.41	222.97	241.55	0.054916			0.057577
1.9	11	37	26	225630	495	470	510	183.95	174.66	189.53	0.025507			0.053410
2.0	62	88	26	725940	905	830	945	336.32	308.45	351.18	0.152598			0.191575
2.1	53	78	25	627840	890	855	900	330.74	317.74	334.46	0.147228			0.149132
2.2	45	71	26	559170	895	820	920	332.6	304.73	341.89	0.145150			0.125150
2.3	38	64	26	490500	870	815	900	323.31	302.87	334.46	0.137186			0.105025
2.4	30	56	26	412020	860	790	860	319.59	293.58	319.59	0.125607			0.085957
2.5	25	51	26	362970	810	750	840	301.01	278.72	312.16	0.109703			0.075840
2.6	21	48	27	333540	790	735	825	293.58	273.14	306.59	0.102982			0.070350
2.7	15	41	26	264870	745	670	725	276.86	248.99	269.43	0.077797			0.059037
2.8	8	35	27	206010	665	585	650	247.13	217.4	241.55	0.054360			0.050800
2.9	2	28	26	137340	595	500	570	221.11	185.81	211.82	0.036455			0.042631
3.0	60	86	26	706320	860	805	910	319.59	299.16	338.18	0.135434			0.182215
3.1	54	80	26	647460	855	790	895	317.74	293.58	332.6	0.129959			0.156792
3.2	48	74	26	588600	840	780	870	312.16	289.86	323.31	0.122542			0.134916
3.3	38	64	26	490500	820	755	835	304.73	280.57	310.3	0.111132			0.105025
3.4	31	57	26	421830	785	730	800	291.72	271.28	297.3	0.098554			0.088137
3.5	26	53	27	382590	750	720	775	278.72	267.57	288.01	0.089688			0.079735
3.6	21	47	26	323730	700	665	720	260.14	247.13	267.57	0.072052			0.068610
3.7	12	38	26	235440	620	565	620	230.41	209.97	230.41	0.046690			0.054764
3.8	8	34	26	196200	590	500	580	219.26	185.81	215.54	0.036783			0.049544
3.9	14	40	26	255060	535	470	540	198.82	174.66	200.68	0.029190			0.057577

y=b+mx		Berechnete W
m	b	
0.0000002084	0.0089373243	0.145899
0.0000000181	0.0077944922	0.098882
0.8259654161	0.0158013913	0.092749
132.8875625283	28.0000000000	0.090705
0.0331798939	0.0069911511	0.082526
		0.080484
		0.072307
		0.068219
		0.062086
		0.055954
		0.160208
		0.139766
		0.125457
		0.111147
		0.094794
		0.084573
		0.078440
		0.064131
		0.051865
		0.037556
		0.156119
		0.143854
		0.131589
		0.111147
		0.090838
		0.088661
		0.076396
		0.057998
		0.049821
		0.062086



Beobachtung berechnet												
Flugbahn			Windrose									
Konstanten	Abstand [m]	Länge Halbkreis [m]	Winkel [rad]	Winkel [°]			N 0°		O 90°			
kleines Okular	10	0.5	0.05		2.86		W 270°					
grosses Okular	10	0.05	0		0.29		S 180°					
Geschwindigkeit [ms ⁻¹]												
Zeit Minuten	Nord-Süd Azimut φ [°]	Höhe Höhe θ [°]					vektoriell		horizontal	vertikal	in Richtung [°]	
			[m]	x (nach Norden) [m]	y (nach Westen) [m]	z (nach oben) [m]	x	y				
1	90		0	4	0	-4	0					
2	219	14	755.84	-569.95	461.53	182.85	-9.50	7.76	12.27	3.05	309.24	
3	214	28	760.54	-556.71	375.51	357.05	0.22	-1.43	1.45	2.9	171.25	
4	219	34	934.25	-610.34	476.85	522.43	-0.89	1.69	1.91	2.76	332.11	
5	222	33	1246.38	-776.81	699.44	678.83	-2.77	3.71	4.63	2.61	323.21	
6	228	34	1477.26	-819.49	910.13	826.07	-0.71	3.51	3.58	2.45	348.55	
7	233	36	1640.08	-798.52	1059.67	964.01	0.35	2.49	2.52	2.3	7.98	
8	233	37	1815.31	-872.49	1157.84	1092.48	-1.23	1.64	2.05	2.14	323	
9	231	40	1884.48	-908.48	1121.88	1211.32	-0.60	-0.60	0.85	1.98	225.03	
10	231	42	1973.26	-922.85	1139.62	1320.37	-0.24	0.30	0.38	1.82	321	
11	233	45	2007.43	-854.26	1133.64	1419.47	1.14	-0.10	1.15	1.65	94.99	
12	236.5	45.5	2114.89	-818.16	1236.11	1508.45	0.60	1.71	1.81	1.48	19.4	
13	242	44.5	2264.41	-758.24	1426.04	1587.14	1.00	3.17	3.32	1.31	17.51	
14	247	43.8	2391.05	-674.48	1588.97	1655.36	1.40	2.72	3.05	1.14	27.21	
15	254	42	2559.88	-524.36	1828.67	1712.89	2.50	3.99	4.71	0.96	32.06	
16	260	40	2737.23	-364.11	2064.98	1759.46	2.67	3.94	4.76	0.78	34.14	
17	266	38	2915.02	-160.24	2291.47	1794.67	3.40	3.77	5.08	0.59	41.99	
18	268	36.2	3077.82	-86.68	2482.17	1817.78	1.23	3.18	3.41	0.39	21.09	
19	269	34	3265.07	-47.25	2706.95	1826.14	0.66	3.75	3.8	0.14	9.95	
20	270	33	3352.93	0	2812	1826.14	0.79	1.75	1.92	0	24.22	
21	271.2	31.8	3465.45	61.68	2944.61	1826.14	1.03	2.21	2.44	0	24.94	
22	273	30.6	3587.4	161.6	3083.6	1826.14	1.67	2.32	2.85	0	35.71	
23	275	29	3766.71	287.13	3281.9	1826.14	2.09	3.31	3.91	0	32.33	
24	277	27.3	3981.55	431.18	3511.7	1826.14	2.40	3.83	4.52	0	32.08	
25	279	26	4165.73	585.71	3698.04	1826.14	2.58	3.11	4.03	0	39.67	
26	280.5	24.8	4353.63	720.22	3885.94	1826.14	2.24	3.13	3.85	0	35.6	
27	281.5	23.6	4561.36	833.33	4095.95	1826.14	1.89	3.50	3.98	0	28.31	
28	282.8	22.8	4712.42	962.45	4236.25	1826.14	2.15	2.34	3.18	0	42.62	
29	284	22	4874.81	1093.45	4385.59	1826.14	2.18	2.49	3.31	0	41.26	
30	284.5	21	5095.7	1191.12	4605.72	1826.14	1.63	3.67	4.01	0	23.93	
31	284.4	20	5339.27	1247.74	4859.64	1826.14	0.94	4.23	4.34	0	12.57	
32	284.5	19.6	5443.82	1284.05	4965.04	1826.14	0.61	1.76	1.86	0	19.01	
33	285	19.2	5552.82	1357.23	5065.27	1826.14	1.22	1.67	2.07	0	36.14	
34	285.5	19	5609.08	1417.3	5110.6	1826.14	1.00	0.76	1.25	0	52.95	
35	286.5	18.9	5637.66	1514.86	5114.07	1826.14	1.63	0.06	1.63	0	87.97	
36	287.5	18.5	5755.15	1641.18	5205.15	1826.14	2.11	1.52	2.6	0	54.21	
37	288.7	18.1	5877.94	1791.29	5292.13	1826.14	2.50	1.45	2.89	0	59.91	
38	289.8	17.7	6006.38	1938.27	5383.76	1826.14	2.45	1.53	2.89	0	58.06	





Flugbahn															Beobachtung									
Konstanten		Abstand [m]	Länge Halbkreis [m]	Winkel [rad]	Winkel [°]	Windrose		N 0°		W 90°														
kleines Okular		10	0.5	0.05	0.05	O 270°																		
grosses Okula		10	0.05	0	0.29			S 180°																
Zeit Minuten	Nord-Süd		Höhe Höhe θ [°]	Abstand gemessen	Bemerkung klein	Anteil Halbkreis	[m]	x (nach Norden) [m]	y (nach Westen) [m]	z (nach oben) [m]	Geschwindigkeit [ms ⁻¹]		horizontal	vertikal										
	Azimet φ [°]	Höhe θ [°]									vektoriell	y												
nicht korrigiert in Richtung [°]																								
1	90		0				4	0	-4	0														
2	219	14		1.20	klein ganzer K	2.4	83.33	-62.84	50.89	20.16	-1.05	0.91	1.39	0.34	311.14									
3	214	28		1.25	klein ganzer K	2.5	80	-58.56	39.56	37.56	0.07	-0.19	0.2	0.29	159.41									
4	218	34		1.33	gross	1.33	150	-97.99	76.56	83.88	-0.66	0.62	0.9	0.77	313.22									
5	222	33		1.17	gross	1.17	171.43	-106.84	96.2	93.37	-0.15	0.33	0.36	0.16	335.74									
6	228	34		1.00	gross	1	200	-110.95	123.22	111.84	-0.07	0.45	0.46	0.31	351.36									
7	233	36		1.00	gross	1	200	-97.38	129.22	117.56	0.23	0.10	0.25	0.1	66.14									
8	233	37		0.80	gross	0.8	250	-120.16	159.45	150.45	-0.38	0.50	0.63	0.55	323									
9	231	40		0.67	gross	0.67	300	-144.63	178.6	192.84	-0.41	0.32	0.52	0.71	308.04									
10	231	42		0.67	gross	0.67	300	-140.3	173.26	200.74	0.07	-0.09	0.11	0.13	141									
11	233	45		0.50	gross	0.5	400	-170.22	225.89	282.84	-0.50	0.88	1.01	1.37	330.38									
12	236.5	45.5		0.50	gross	0.5	400	-154.74	233.79	285.3	0.26	0.13	0.29	0.04	62.95									
13	242	44.5		0.50	gross	0.5	400	-133.94	251.91	280.36	0.35	0.30	0.46	-0.08	48.95									
14	247	43.8		0.50	gross	0.5	400	-112.81	265.75	276.86	0.35	0.23	0.42	-0.06	56.77									
15	254	42		0.50	gross	0.5	400	-81.94	285.74	267.65	0.51	0.33	0.61	-0.15	57.08									
16	260	40		0.5	gross	0.5	400	-53.21	301.76	257.12	0.48	0.27	0.55	-0.18	60.85									
17	266	38		0.33	gross	0.33	600	-32.98	471.65	369.4	0.34	2.83	2.85	1.87	6.79									
18	268	36.2		0.33	gross	0.33	600	-16.9	483.88	354.36	0.27	0.20	0.34	-0.25	52.76									
19	269	34		0.33	gross	0.33	600	-8.68	497.35	335.52	0.14	0.22	0.26	-0.31	31.39									
20	270	33		0.33	gross	0.33	600	0	503.2	326.78	0.14	0.10	0.17	-0.15	56									
21	271.2	31.8		0.33	gross	0.33	600	10.68	509.82	316.17	0.18	0.11	0.21	-0.18	58.2									
22	273	30.6		0.33	gross	0.33	600	27.03	515.74	305.42	0.27	0.10	0.29	-0.18	70.11									
23	275	29		0.29	gross	0.29	685.71	52.27	597.46	332.44	0.42	1.36	1.43	0.45	17.17									
24	277	27.3		0.25	gross	0.25	800	86.64	705.59	366.92	0.57	1.80	1.89	0.57	17.63									
25	279	26		0.25	gross	0.25	800	112.48	710.18	350.7	0.43	0.08	0.44	-0.27	79.93									
26	280.5	24.8		0.25	gross	0.25	800	132.34	714.06	335.56	0.33	0.06	0.34	-0.25	78.95									
27	281.5	23.6		0.25	gross	0.25	800	146.15	718.37	320.28	0.23	0.07	0.24	-0.25	72.66									
28	282.8	22.8		0.25	gross	0.25	800	163.39	719.16	310.01	0.29	0.01	0.29	-0.17	87.37									
29	284	22		0.33	innerer Kreis	0.2	1000	224.31	899.64	374.61	1.02	3.01	3.17	1.08	18.65									
30	284.5	21		0.33	innerer Kreis	0.13	1500	350.62	1355.77	537.55	2.11	7.60	7.89	2.72	15.48									
31	284.4	20		0.33	innerer Kreis	0.13	1500	350.54	1365.26	513.03	0.00	0.16	0.16	-0.41	359.48									
32	284.5	19.6		0.33	innerer Kreis	0.13	1500	353.81	1368.08	503.18	0.05	0.05	0.07	-0.16	49.23									
33	285	19.2		0.33	innerer Kreis	0.13	1500	366.63	1368.3	493.3	0.21	0.00	0.21	-0.16	89.02									
34	285.5	19		0.33	innerer Kreis	0.13	1500	375.02	1366.7	488.35	0.21	-0.03	0.21	-0.08	97.36									
35	286.5	18.9		0.33	innerer Kreis	0.13	1500	403.05	1360.69	485.88	0.40	-0.10	0.41	-0.04	104.03									
36	287.5	18.5		0.33	innerer Kreis	0.13	1500	427.75	1356.65	475.96	0.41	-0.07	0.42	-0.17	99.29									
37	288.7	18.1		0.33	innerer Kreis	0.13	1500	457.12	1350.51	466.01	0.49	-0.10	0.5	-0.17	101.81									
38	289.8	17.7		0.33	innerer Kreis	0.13	1500	484.05	1344.51	456.05	0.45	-0.10	0.46	-0.17	102.55									

Hodograph

