INSTITUT FÜR SOLARTECHNIK

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Type977 fitting for heat pump HP25L-M-WEB-

Parametric Heat Pump calculation

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Table 1: Fitted coefficients for the heat pump.

Coefficient	Description	
		$[kW]$
P_{Q_1}	1^{st} *condenser polynomial coefficient*	2.5033e+01
P_{Q_2}	2^{st} *condenser polynomial coefficient*	2.2522e+02
P_{Q_3}	3^{st} *condenser polynomial coefficient*	7.3843e+01
P_{Q_4}	4^{st} *condenser polynomial coefficient*	-8.4936e+01
P_{Q_5}	5^{st} *condenser polynomial coefficient*	3.1917e+02
P_{Q_6}	6^{st} *condenser polynomial coefficient*	-4.6866e+02
P_{COP_1}	1^{st} *COP polynomial coefficient*	9.6808e+00
P_{COP_2}	2^{st} *COP polynomial coefficient*	5.3607e+01
P_{COP_3}	3^{st} *COP polynomial coefficient*	-5.5041e+01
P_{COP_4}	4^{st} *COP polynomial coefficient*	-1.7681e+02
P_{COP_5}	5^{st} *COP polynomial coefficient*	7.0311e+01
P_{COP_6}	6^{st} *COP polynomial coefficient*	9.0167e+01
$\dot{m}_{cond}$	4500.00 $[kg/h]$	
$\dot{m}_{evap}$	11250.00 $[kg/h]$	
COP_{nom} (A0W35)	4.12	
$Q_{cond,nom}$ (A0W35)	25.24 $[kW]$	
$Q_{evap,nom}$ (A0W35)	19.11 $[kW]$	
$W_{comp,nom}$ (A0W35)	6.13 $[kW]$	
RMS_{COP}	$1.09e-01$	
$RMS_{Q_{cond}}$	$8.78e-01$	
$RMS_{W_{comp}}$	$1.30e-01$	
Fit model	Average Temperature	

Table 2: Differences between experiments and fitted data for the heat pump. $error = 100 \cdot |\frac{Q_{exp}-Q_{num}}{Q_{exp}}|$ and $RMS = \sqrt{\sum \frac{(Q_{exp}-Q_{num})^2}{n_p}}$ where n_p is the number of data points.

$T_{cond,out}$ ^oC	$T_{evap,in}$ ^oC	COP [–]	COP_{exp} [–]	error [%]	Q_{cond} $[kW]$	$Q_{cond,exp}$ $[kW]$	error [%]	W_{comp} $[kW]$	$W_{comp,exp}$ $[kW]$	error [%]
35.00	20.00	6.68	6.73	0.7	40.54	40.16	0.9	6.07	5.97	1.65
35.00	10.00	5.32	5.33	0.2	32.57	33.10	1.6	6.12	6.21	1.41
35.00	7.00	4.96	5.07	2.3	30.31	31.60	4.1	6.11	6.23	1.86
35.00	2.00	4.30	4.08	5.3	26.60	25.22	5.5	6.19	6.18	0.15
35.00	-7.00	3.35	3.25	3.0	20.42	19.61	4.1	6.09	6.03	1.08
35.00	-15.00	2.64	2.76	4.4	15.39	16.05	4.1	5.82	5.81	0.25
45.00	7.00	3.77	3.91	3.6	28.63	29.68	3.5	7.60	7.60	0.05
45.00	2.00	3.24	3.14	3.0	24.86	23.64	5.2	7.68	7.52	2.12
45.00	-7.00	2.49	2.45	1.7	18.68	18.01	3.7	7.50	7.35	2.02
45.00	-15.00	1.96	2.02	3.1	13.66	14.48	5.6	6.98	7.17	2.64
50.00	20.00	4.55	4.38	3.8	37.54	36.85	1.9	8.25	8.41	1.85
50.00	15.00	4.04	4.12	1.8	33.56	34.69	3.3	8.30	8.42	1.45
50.00	7.00	3.26	3.38	3.7	27.34	28.28	3.3	8.39	8.36	0.36
50.00	2.00	2.80	2.73	2.3	23.55	22.61	4.2	8.42	8.27	1.79
50.00	-7.00	2.15	2.10	2.4	17.36	17.02	2.0	8.07	8.10	0.38
55.00	20.00	3.96	3.91	1.2	35.95	35.26	2.0	9.08	9.01	0.80
55.00	7.00	2.81	2.98	5.7	25.74	26.70	3.6	9.15	8.96	2.18
55.00	-7.00	1.86	1.77	5.0	15.69	15.43	1.7	8.42	8.70	3.21
Sum				53.0			60.2			25.23
RMS_{COP}	$1.09e-01$									
$RMS_{Q_{cond}}$	$8.78e-01$									
$RMS_{W_{comp}}$	$1.30e-01$									

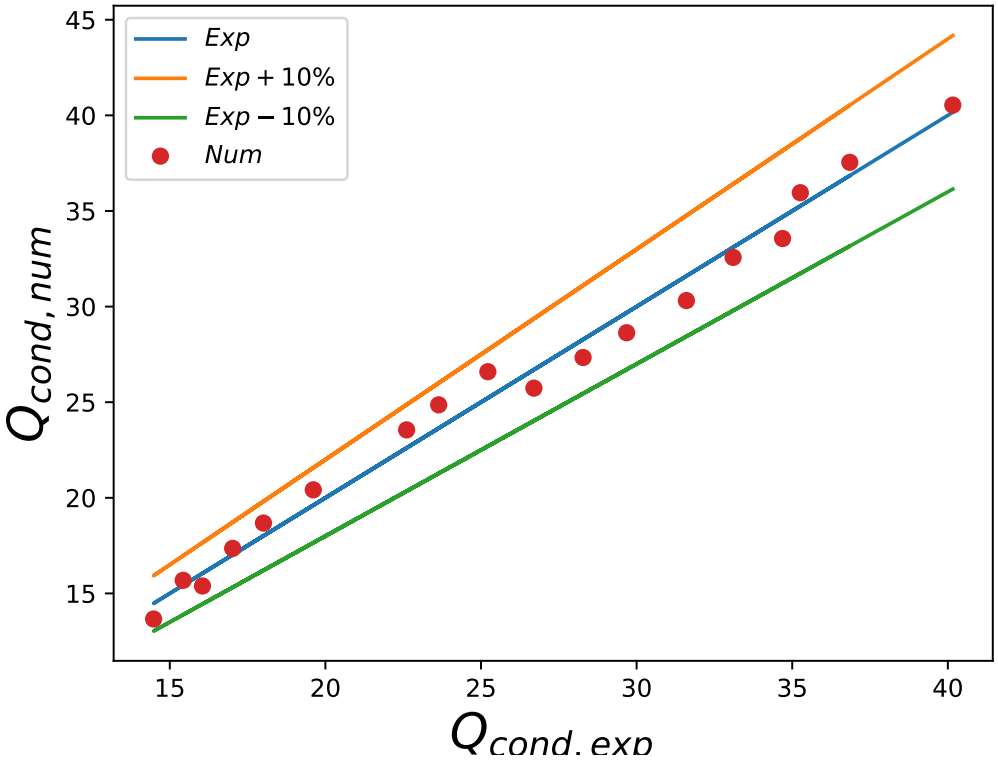

Figure 1: Q_{cond} differences between experiments and fitted data

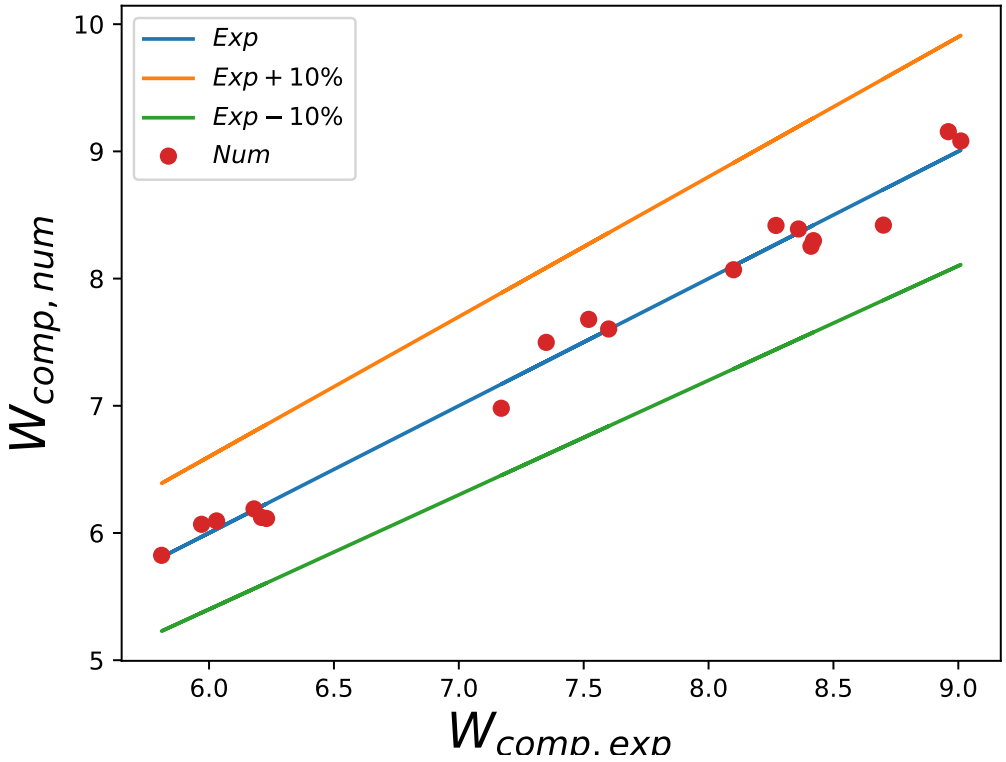

Figure 2: W_{comp} differences between experiments and fitted data

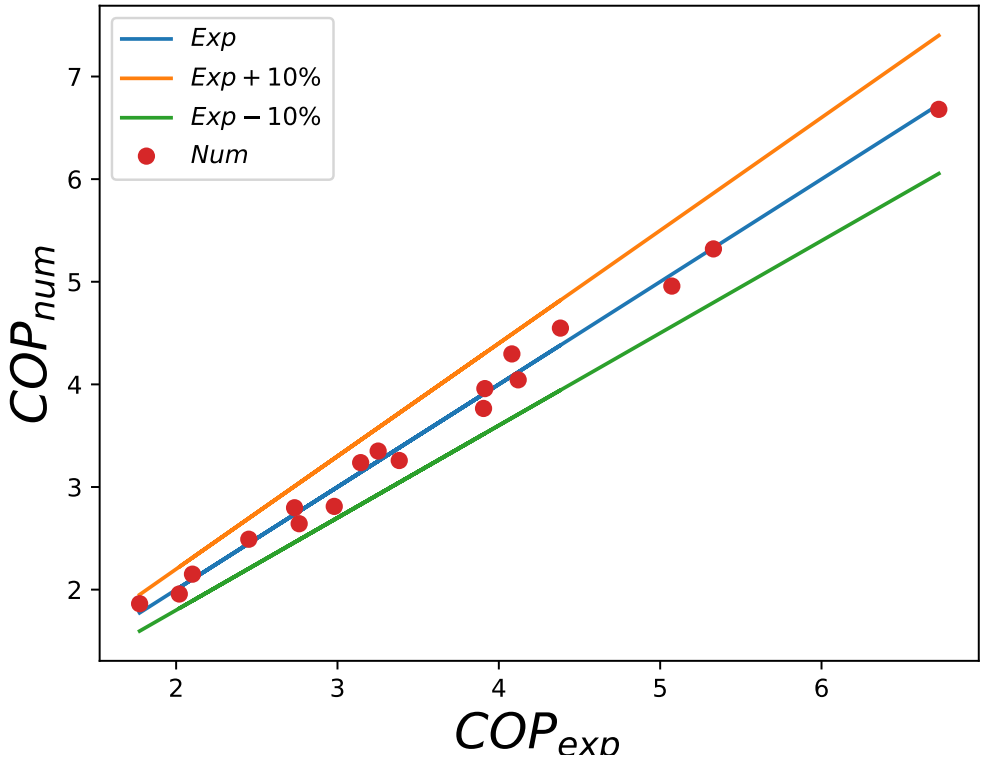

Figure 3: COP differences between experiments and fitted data