INSTITUT FÜR SOLARTECHNIK

SPF

HSR
HOCHSCHULE FÜR TECHNIK
RAPPERSWIL

FHO Fachhochschule Ostschweiz

Type977 fitting for heat pump LEXETA$_E W J R_F I T$

Parametric Heat Pump calculation

Dani Carbonell

dani.carbonell@solarenergy.ch

Tuesday 9th July, 2013 at: 09:07 h

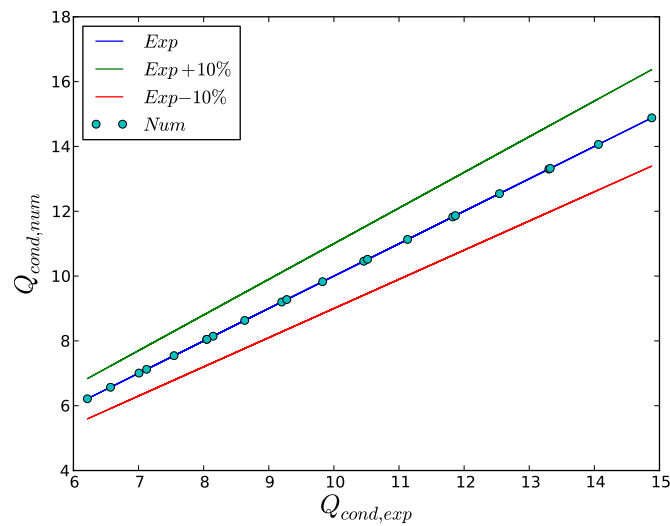Figure 1: Q_{cond} differences between experiments and fitted data

Table 1: Fitted coefficients for the heat pump.

Coefficient	Description	
		$[kW]$
P_{Q_1}	1st condenser polynomial coefficient	9.7093e+00
P_{Q_2}	2st condenser polynomial coefficient	7.1006e+01
P_{Q_3}	3st condenser polynomial coefficient	-1.4097e+01
P_{Q_4}	4st condenser polynomial coefficient	-7.1184e+01
P_{Q_5}	5st condenser polynomial coefficient	1.7675e+02
P_{Q_6}	6st condenser polynomial coefficient	1.4445e+01
P_{COP_1}	1st COP polynomial coefficient	9.6717e+00
P_{COP_2}	2st COP polynomial coefficient	7.4779e+01
P_{COP_3}	3st COP polynomial coefficient	-4.5478e+01
P_{COP_4}	4st COP polynomial coefficient	-2.2890e+02
P_{COP_5}	5st COP polynomial coefficient	1.3432e+02
P_{COP_6}	6st COP polynomial coefficient	6.9782e+01
$\dot{m}_{cond}$	1397.20 $[kg/h]$	
$\dot{m}_{evap}$	1930.40 $[kg/h]$	
COP_{nom} (A0W35)	3.44	
$Q_{cond,nom}$ (A0W35)	6.75 $[kW]$	
$W_{comp,nom}$ (A0W35)	1.96 $[kW]$	
COP_{nom} (A2W35)	5.33	
$Q_{c,nom}$ (A2W35)	8.60 $[kW]$	
$W_{comp,nom}$ (A2W35)	1.61 $[kW]$	
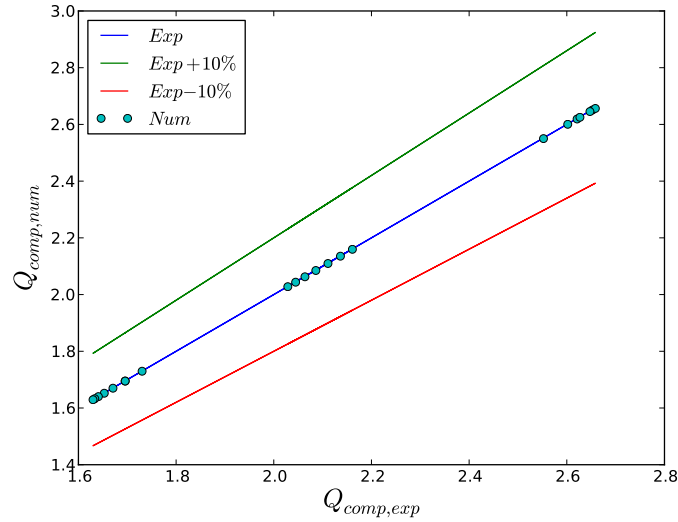
Figure 2: W_{comp} differences between experiments and fitted data

HSR
HOCHSCHULE FÜR TECHNIK
RAPPERSWIL

FHO Fachhochschule Ostschweiz

INSTITUT FÜR
SOLARTECHNIK

SPF

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

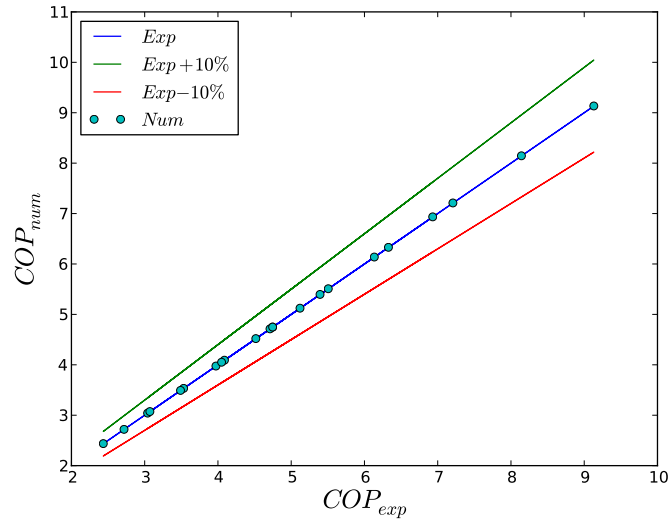| $T_{cond,out}$ ^oC	$T_{evap,in}$ ^oC	COP $[-]$	COP_{exp} $[-]$	error $[\%]$	Q_{cond} $[kW]$	$Q_{cond,exp}$ $[kW]$	error $[\%]$	W_{comp} $[kW]$	$W_{comp,exp}$ $[kW]$	error $[\%]$
37.45	0.00	4.75	4.75	0.0	8.05	8.05	0.0	1.69	1.70	0.04
38.16	5.00	5.51	5.51	0.1	9.20	9.20	0.0	1.67	1.67	0.05
38.93	10.00	6.33	6.33	0.1	10.46	10.46	0.0	1.65	1.65	0.05
39.77	15.00	7.21	7.21	0.0	11.83	11.83	0.0	1.64	1.64	0.04
40.68	20.00	8.15	8.14	0.0	13.30	13.30	0.0	1.63	1.63	0.04
41.65	25.00	9.13	9.13	0.0	14.88	14.88	0.0	1.63	1.63	0.04
51.54	-5.00	3.04	3.04	0.1	6.57	6.57	0.0	2.16	2.16	0.06
52.14	0.00	3.53	3.53	0.0	7.54	7.55	0.0	2.14	2.14	0.05
52.81	5.00	4.09	4.09	0.1	8.63	8.63	0.0	2.11	2.11	0.07
53.54	10.00	4.71	4.71	0.1	9.83	9.83	0.0	2.08	2.09	0.06
54.35	15.00	5.40	5.39	0.1	11.13	11.13	0.0	2.06	2.06	0.05
55.21	20.00	6.14	6.13	0.1	12.54	12.54	0.0	2.04	2.04	0.05
56.15	25.00	6.93	6.93	0.0	14.06	14.06	0.0	2.03	2.03	0.05
66.32	-5.00	2.44	2.43	0.1	6.21	6.21	0.0	2.55	2.55	0.09
66.88	0.00	2.72	2.72	0.1	7.12	7.12	0.0	2.62	2.62	0.08
67.51	5.00	3.07	3.07	0.1	8.14	8.15	0.0	2.65	2.65	0.06
68.20	10.00	3.49	3.49	0.1	9.28	9.28	0.0	2.66	2.66	0.08
68.97	15.00	3.98	3.97	0.1	10.52	10.52	0.0	2.65	2.65	0.08
69.80	20.00	4.52	4.52	0.1	11.87	11.87	0.0	2.63	2.63	0.07
70.69	25.00	5.12	5.12	0.1	13.32	13.32	0.0	2.60	2.60	0.06
36.81	-5.00	4.05	4.05	0.0	7.01	7.01	0.0	1.73	1.73	0.04
37.45	0.00	4.75	4.75	0.0	8.05	8.05	0.0	1.69	1.70	0.04
Sum				1.2			0.1			1.27
RMS_{COP}	$2.62e-03$									
$RMS_{Q_{cond}}$	$3.18e-04$									
$RMS_{W_{comp}}$	$1.37e-03$									

Figure 3: COP differences between experiments and fitted data