

$$P_a = (a_{10} + a_{11}T_a + a_{12}T_a^2)P_{heater} + (a_{20} + a_{21}T_a + a_{22}T_a^2)P_{core-Q}$$

These are the parameters I obtained:

Original and Fitted Model Parameters with standard deviation

Symbol	Start Value	Fit Value	Uncertainty
ca0	6.0000e+01	1.1834e+01 ± 1.2211e+00	(10.319%)
ca1	0.0000e+00	4.1873e-02 ± 3.4949e-03	(8.346%)
ca2	0.0000e+00	0.0000e+00 ± 0.0000e+00	(NaN%)
cb0	1.0000e+03	6.7845e+02 ± 7.9568e+00	(1.173%)
cb1	0.0000e+00	1.2610e-01 ± 2.5860e-02	(20.508%)
cb2	0.0000e+00	0.0000e+00 ± 0.0000e+00	(NaN%)
kas0	2.0000e-02	1.5819e-02 ± 1.4693e-03	(9.288%)
kas1	1.0000e-04	1.2648e-05 ± 4.6929e-06	(37.104%)
kas2	0.0000e+00	0.0000e+00 ± 0.0000e+00	(NaN%)
kab0	7.0000e-01	6.1216e-01 ± 1.7269e-02	(2.821%)
kab1	0.0000e+00	1.0829e-03 ± 5.6023e-05	(5.174%)
kab2	0.0000e+00	0.0000e+00 ± 0.0000e+00	(NaN%)
kbs0	5.6000e-02	4.3935e-02 ± 1.6050e-03	(3.653%)
kbs1	0.0000e+00	1.2141e-04 ± 5.5474e-06	(4.569%)
kbs2	0.0000e+00	0.0000e+00 ± 0.0000e+00	(NaN%)
a10	1.0000e+00	1.0000e+00 ± 0.0000e+00	(0.000%)
a11	0.0000e+00	0.0000e+00 ± 0.0000e+00	(NaN%)
a12	0.0000e+00	0.0000e+00 ± 0.0000e+00	(NaN%)
a20	5.2000e-01	3.9120e-02 ± 7.0722e-03	(18.078%)
a21	0.0000e+00	2.9826e-03 ± 6.3571e-05	(2.131%)
a22	0.0000e+00	-4.0200e-06 ± 1.1794e-07	(2.934%)

The NRMSE figures of merit were:

Fit Percentage 98.61% for T_Core

Fit Percentage 98.83% for T_Inner

And the power residuals are shown in the chart below