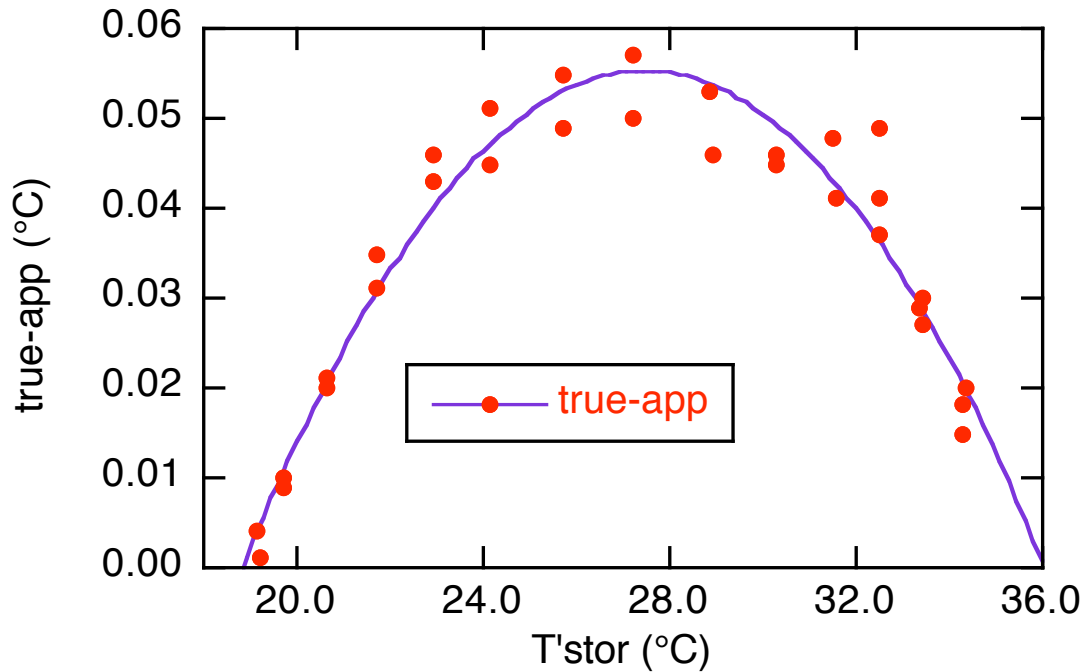


Trial-and-Error Polynomial Fitting

Guidelines:

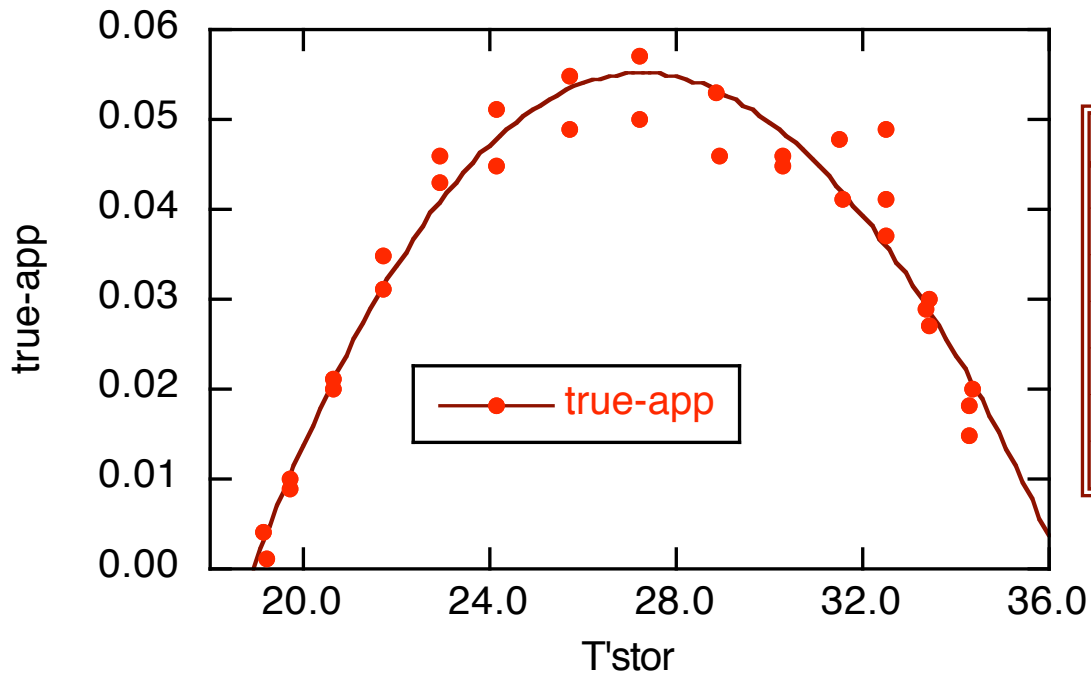
- (1) Minimum variance — $s_y^2 = \frac{\sum_{i=1}^n \epsilon_i^2}{n - p} = \frac{\text{Chisq}}{n - p}$
(Are any parameters smaller in magnitude than their ϵ s?)
- (2) “Smooth” curve ?
(Are the data “overfitted”?)
- (3) Extrapolating ability ?
(Can I trust it outside the data range?)
- (4) Is it “good enough” ?
(Do I need to collect more data?)

In the end, there is no simple or single answer to these questions.



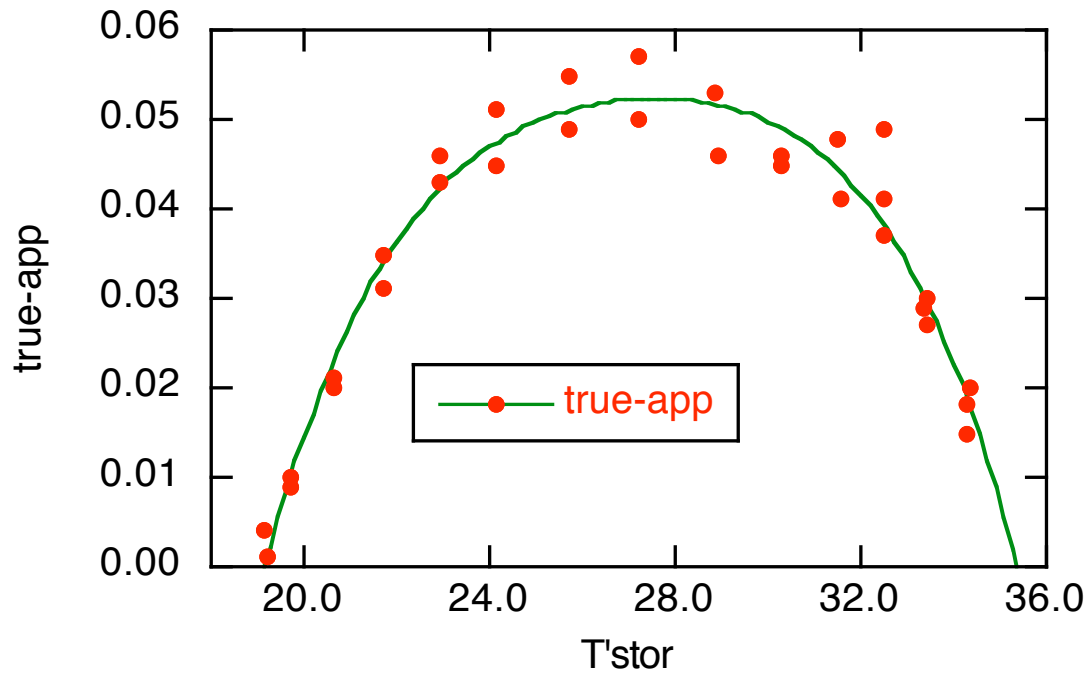
y = a + b*(x-25) + c*(x-25)^...		
	Value	Error
a	0.050861789	0.001247068
b	0.0036498518	0.0002037433
c	-0.00074572609	3.839555e-05
Chisq	0.00049905721	NA
R	0.96765516	NA

Chisq/(30-3) = 1.85E-5



y = a + b*(x-25) + c*(x-25)^...		
	Value	Error
a	0.051376021	0.001429509
b	0.0034107011	0.0003775269
c	-0.00078497076	6.480743e-05
d	7.3586261e-06	9.748138e-06
Chisq	0.00048874228	NA
R	0.96833463	NA

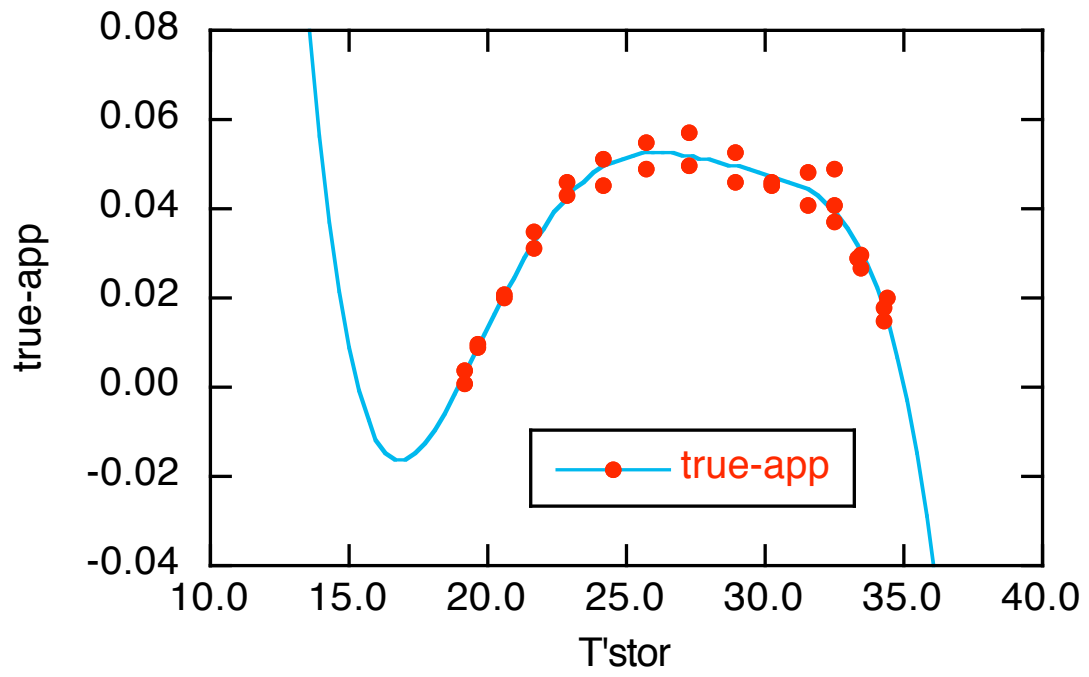
Chisq/(30-4) = 1.88E-5



$$y = a + b*(x-25) + c*(x-25)^2 + d*(x-25)^3 + f*(x-25)^4$$

	Value	Error
a	0.049765931	0.001368606
b	0.0021478872	0.0005382424
c	-0.00053828704	0.0001004806
d	5.5113812e-05	1.816879e-05
f	-6.5369506e-06	2.192571e-06
Chisq	0.00036422288	NA
R	0.97649966	NA

Chisq/(30-5) = 1.46E-5



$$y = a + b*(x-25) + c*(x-25)^2 + d*(x-25)^3 + g*(x-25)^4$$

	Value	Error
a	0.051679729	0.001504998
b	0.0016839682	0.0005350699
c	-0.00096935778	0.000206107
d	0.00010361087	2.664988e-05
f	4.9164101e-06	5.292432e-06
g	-1.2421487e-06	5.303099e-07
Chisq	0.00029867649	NA
R	0.98077039	NA

Chisq/(30-6) = 1.24E-5