Hamburg Model

$$\Delta N_{eff} = g_a e^{\frac{-t}{\tau_a}} \Phi_{eq} + g_y \left(1 - \frac{1}{1 + \frac{t}{\tau_y}}\right) \Phi_{eq} + N_C \quad (1)$$

- $\Delta N_{eff} = N_{eff}(t_{ann}) - N_{eff,pre\text{-}irr}$
- Parameters to fit: g_a (beneficial annealing introduction rate), g_y (reverse annealing introduction rate), τ_a (beneficial annealing time constant), τ_y (reverse annealing time constant), N_C (stable damage)
- For HGCAL diodes $\Phi_{eq} = 2.5 \times 10^{15}$ cm^{-2}

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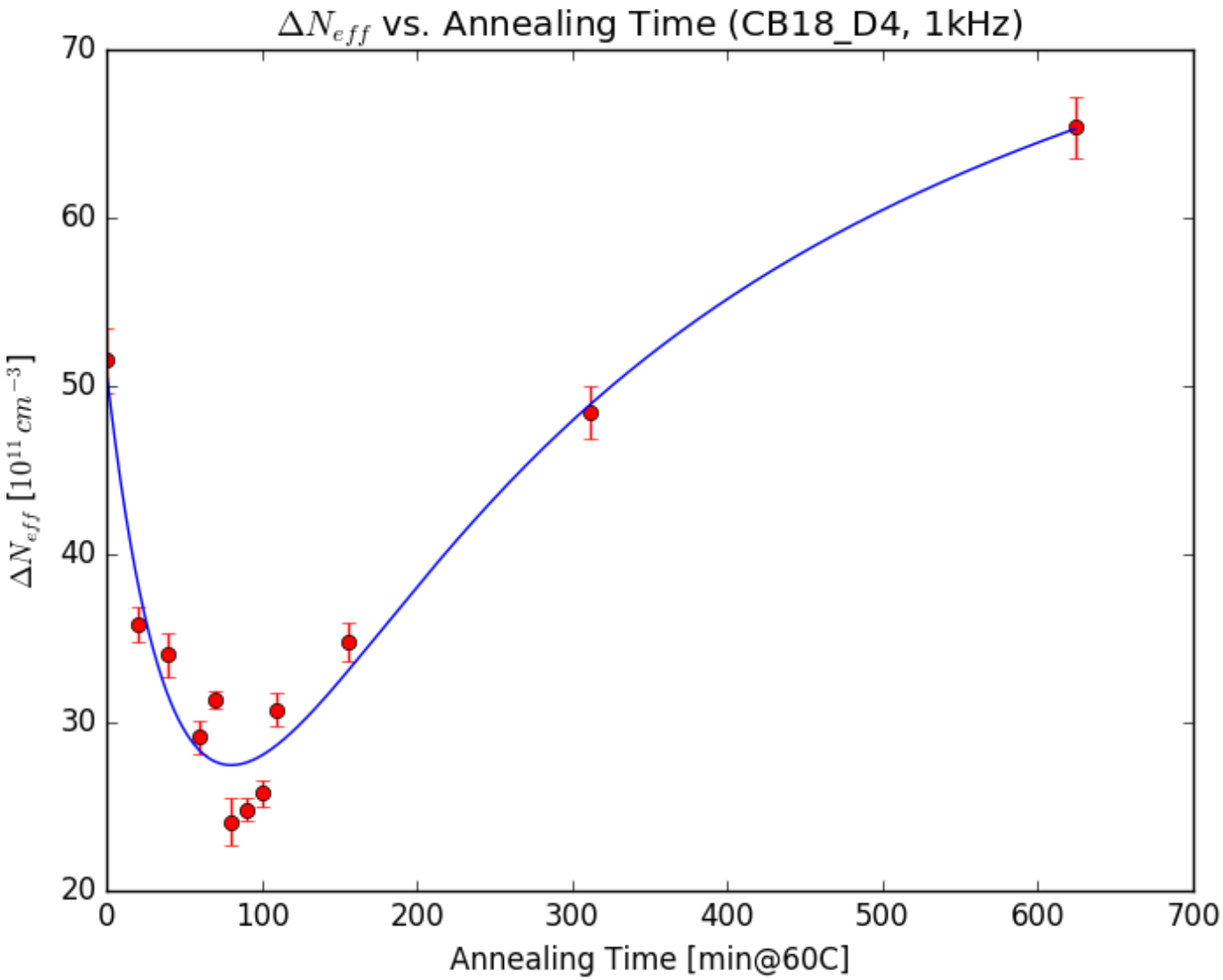
Hamburg Model fits: CB18_D4



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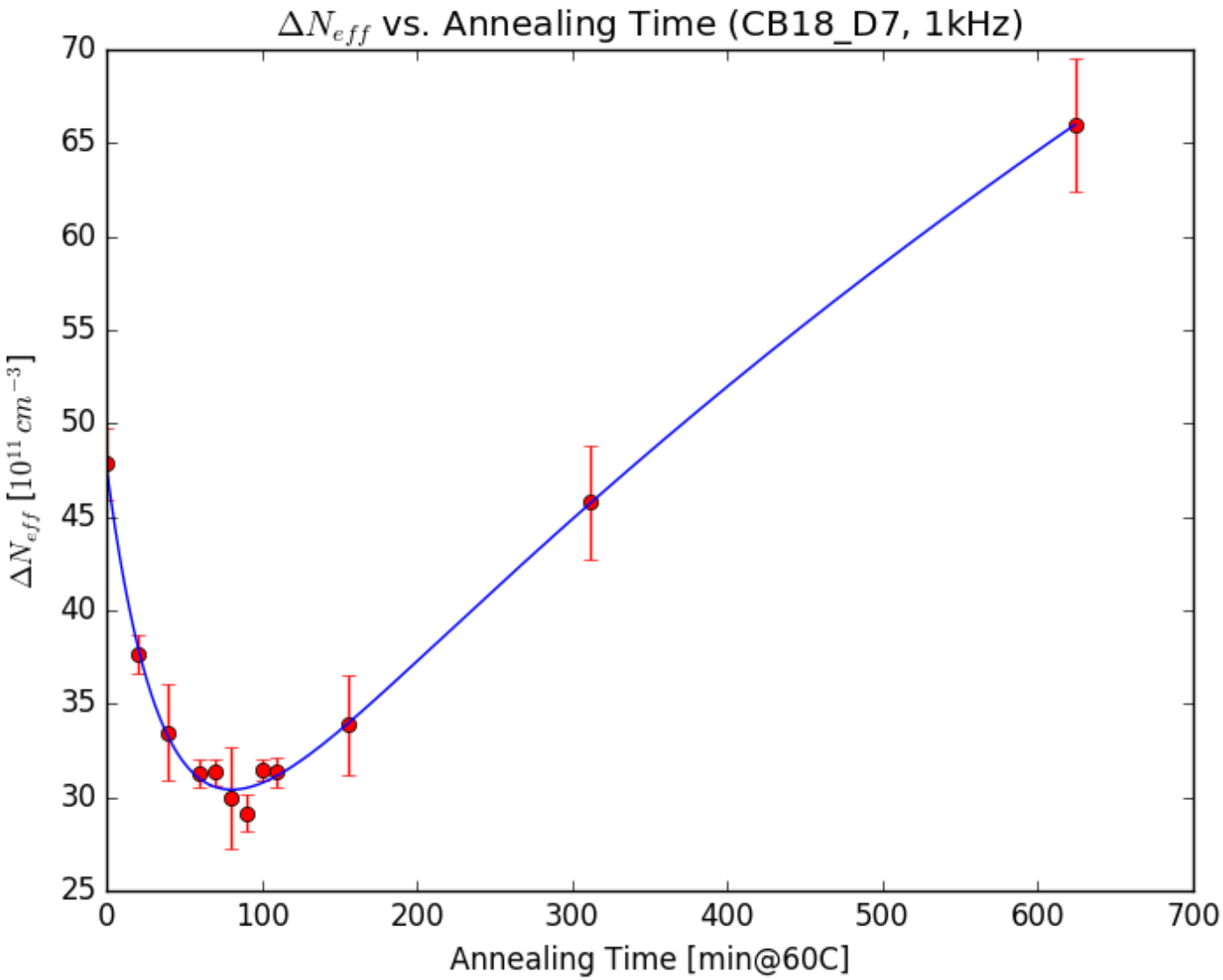
Hamburg Model fits: CB18_D7



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Hamburg fit parameters

156min@60C $\approx$ 15min@80C

Parameter	D4	D7	MoII	Sagir
g_a (10^{-2} cm^{-1})	0.269	0.1133	1.81	1.16
N_C (10^{11} cm^{-3})	-16.4	19.38	N/A	N/A
g_y (10^{-2} cm^{-1})	0.437	0.8029	1.49	4.77
t_a (mins@60C)	50.6	38.44	19	$\sim$24.5
t_y (mins@60C)	212	2063	1260	$\sim$2954
t_a (mins@80C)	$\sim$4.86	$\sim$3.698	2	2.36
t_y (mins@80C)	$\sim$20.4	$\sim$198.5	92	284

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