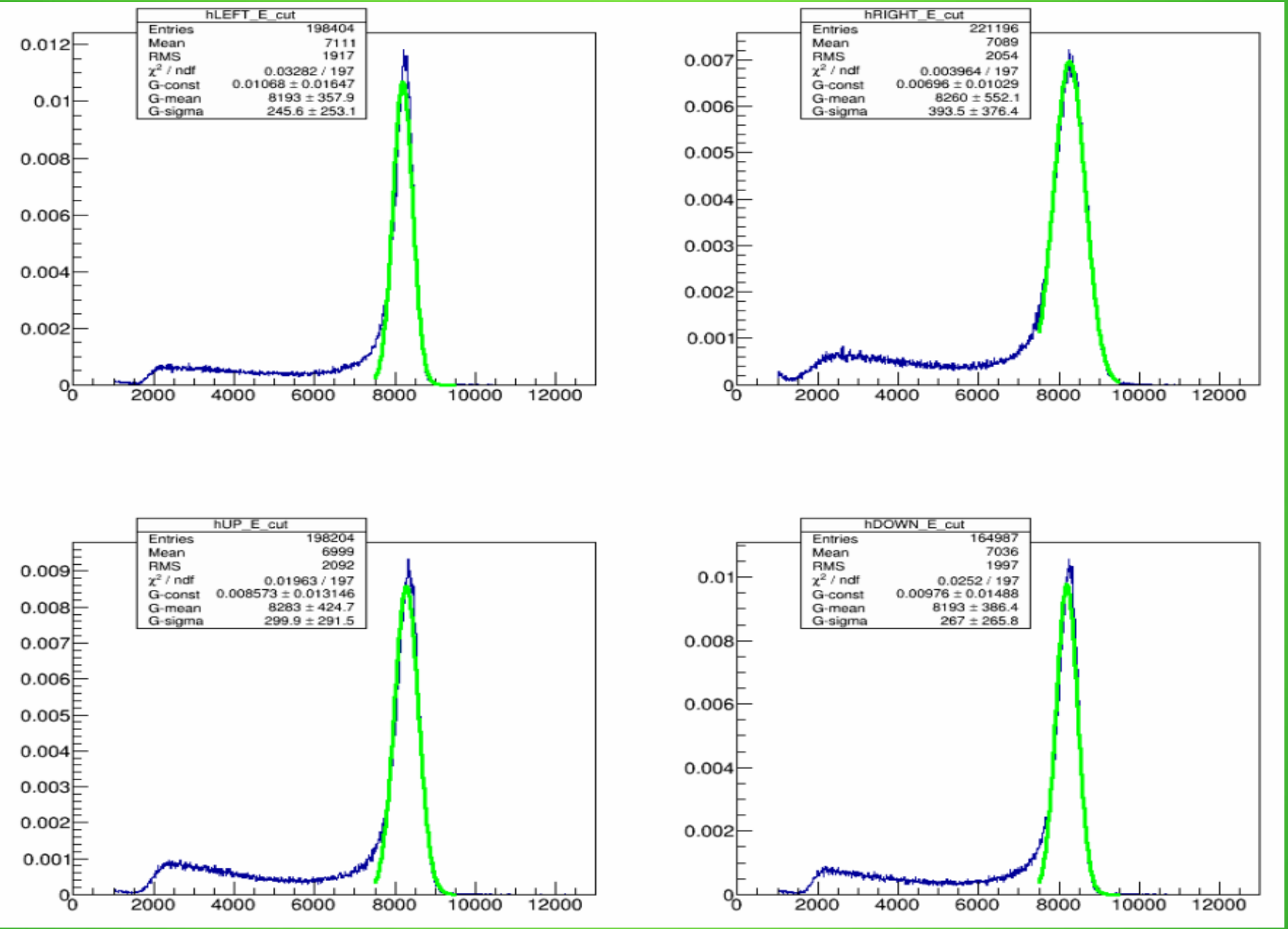
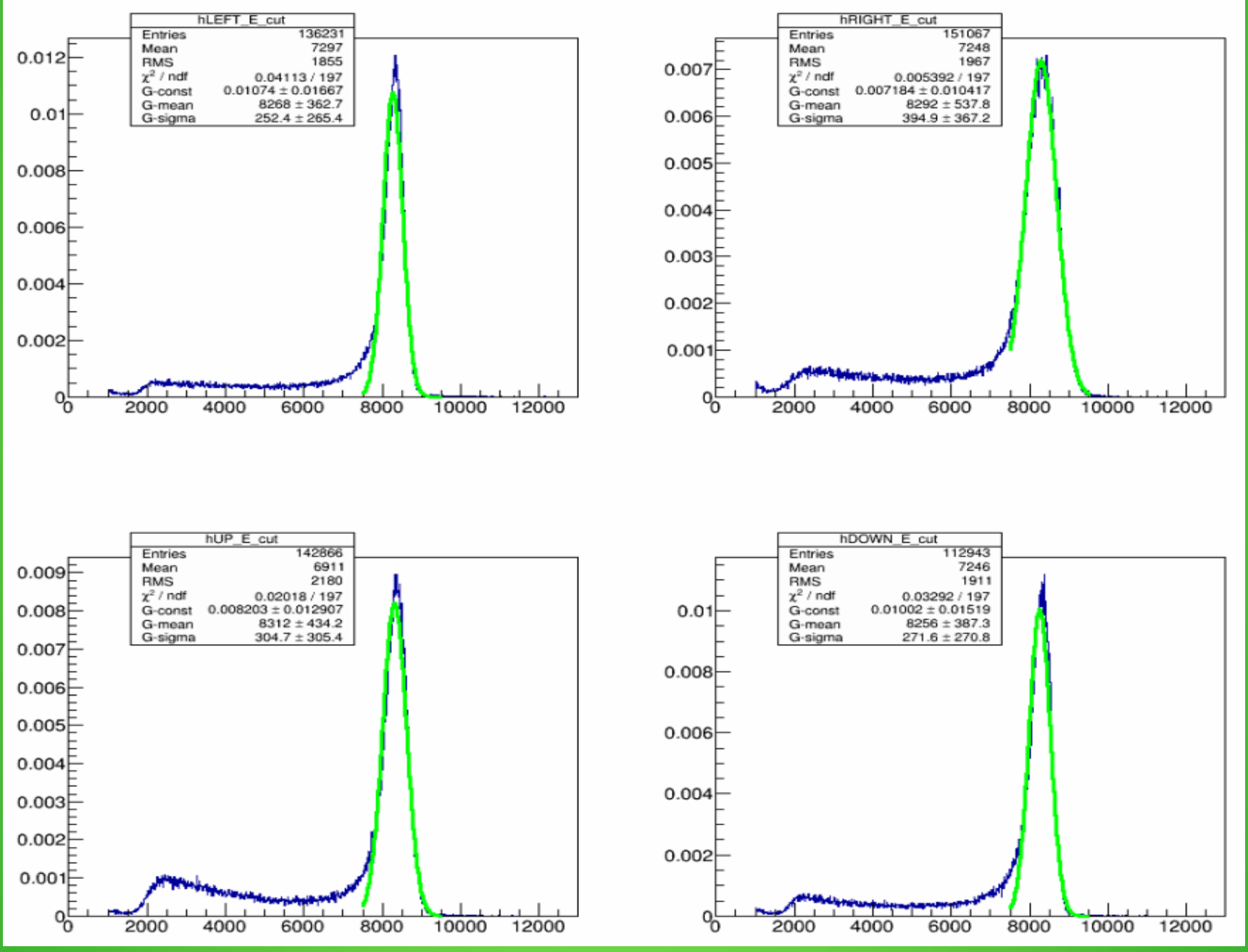
Sensitivity of A_0 and lambda to systematic time-of-flight and energy cuts

- Fit Time-of-Flight spectra with gaussian in range of 48-58ns (target)
- Cut raw energy-spectra based on time-of-flight fit parameters – mean +/- {1.0 , 2.0, 3.0} * sigma
- Fit ToF-cut energy spectra with gaussian in range of Channels 7500:9500
- Determine good events from ToF-cuts and energy spectra fit parameters – again, mean +/- {1.0 , 2.0, 3.0} * sigma, aka energy cuts

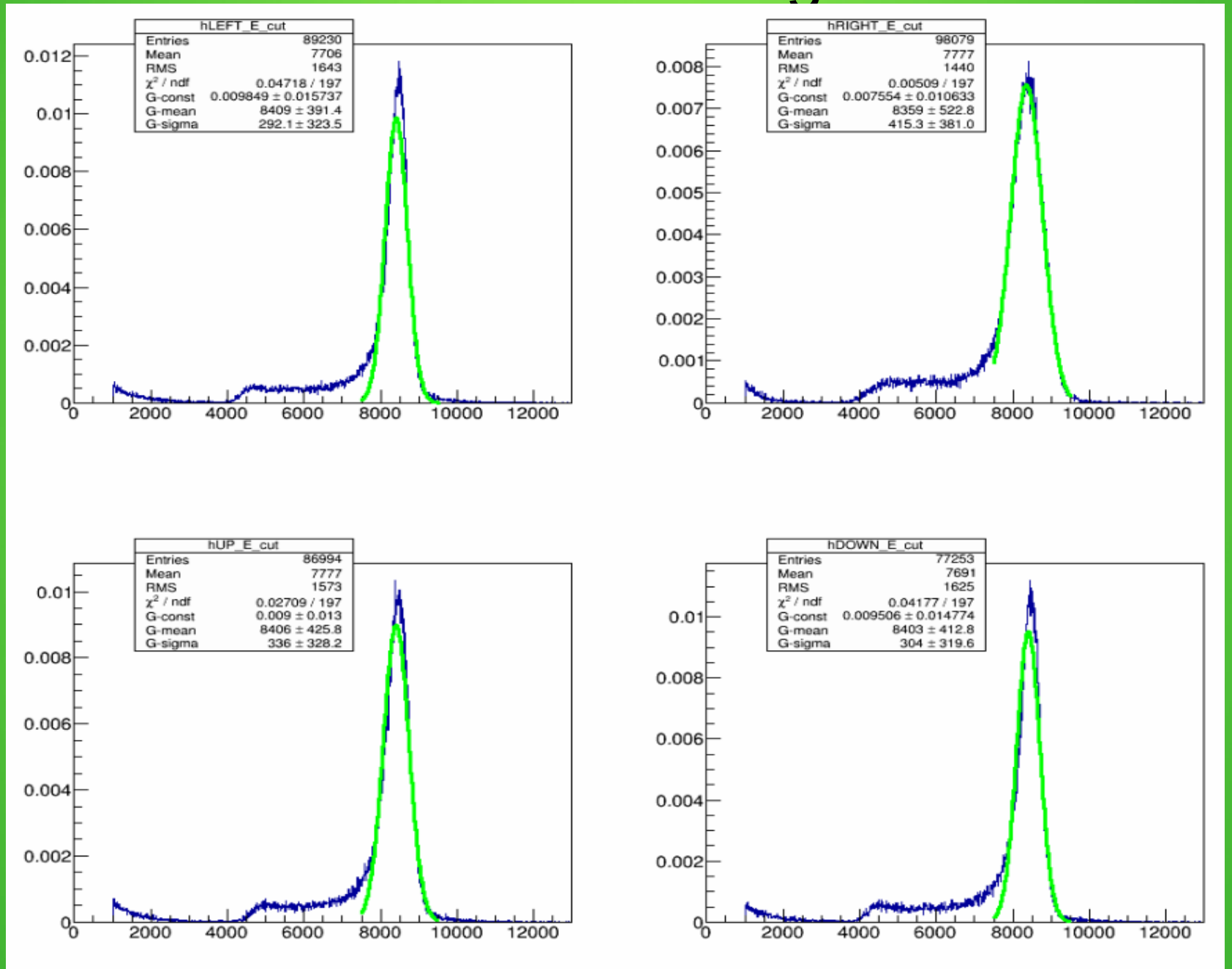
Thick Foil 15, ~1000 nm, Run 7999, ToF-cut mean +/- 1.0 * sigma



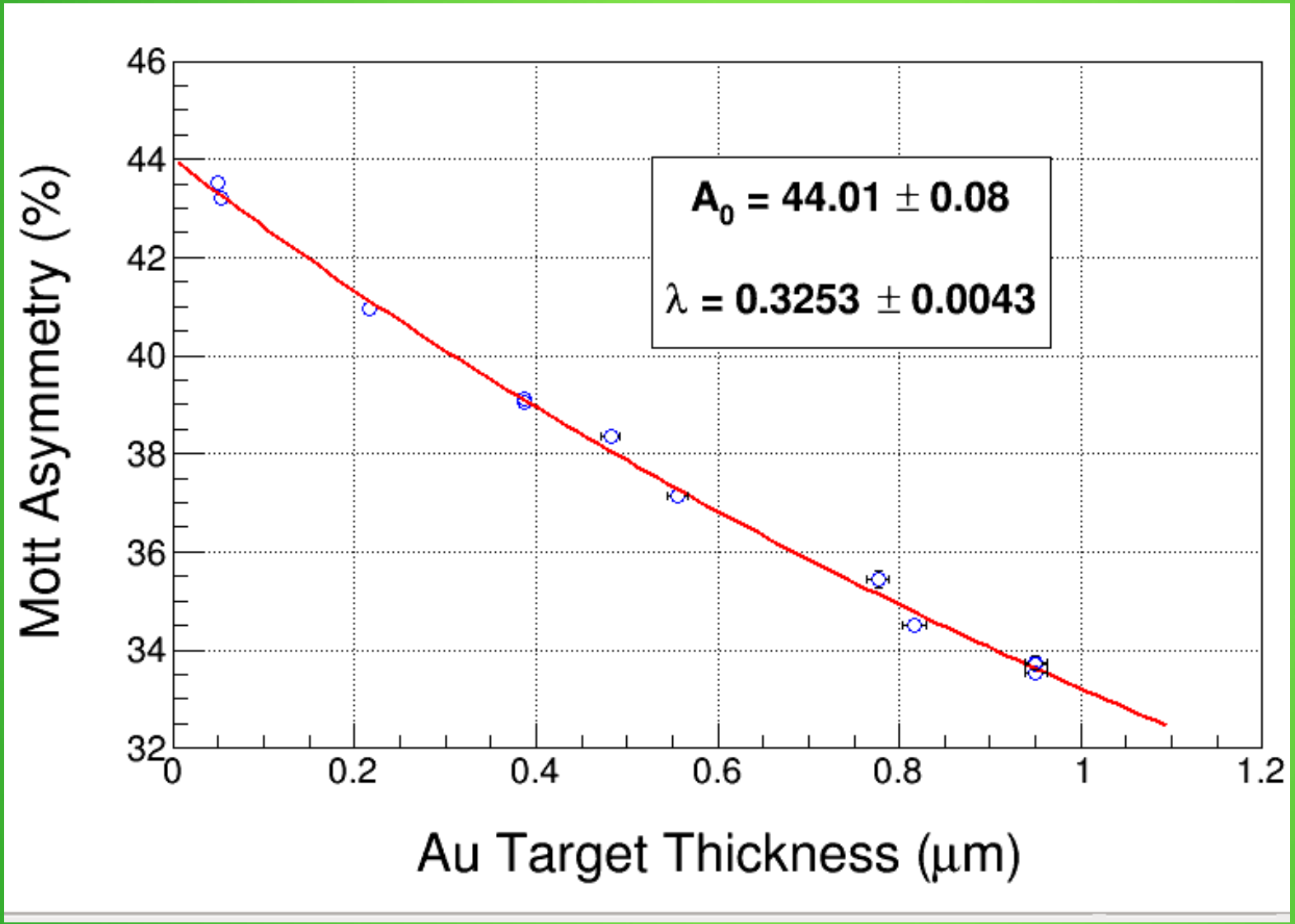
Medium Foil 5, ~500 nm, Run 8041, ToF-cut mean +/- 1.0 * sigma



Thin Foil 12, ~50 nm, Run 8075, ToF-cut mean +/- 1.0 * sigma



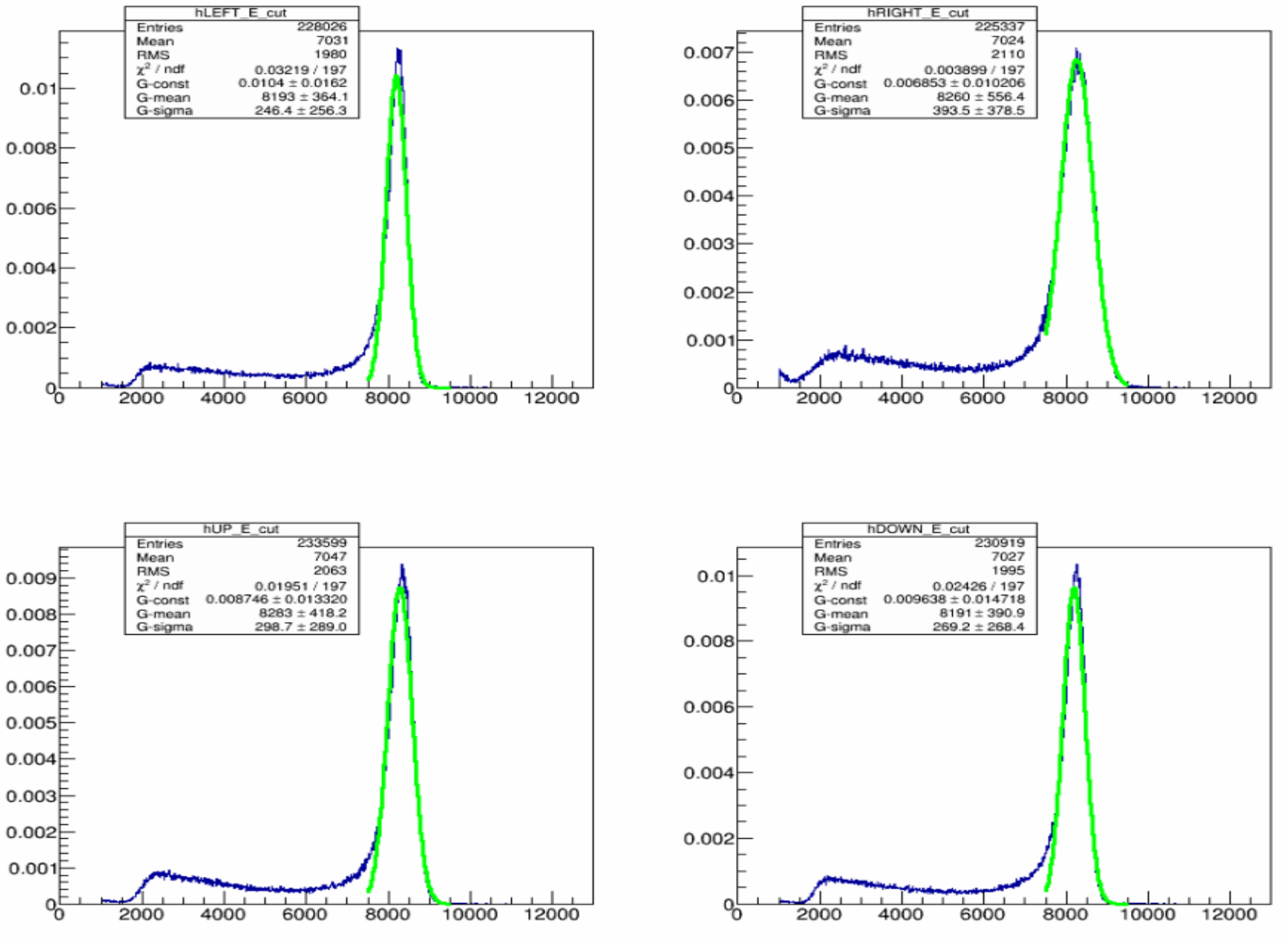
ToF-cut: mean +/- 1.0 * sigma
Energy cut: mean +/- 1.0 * sigma



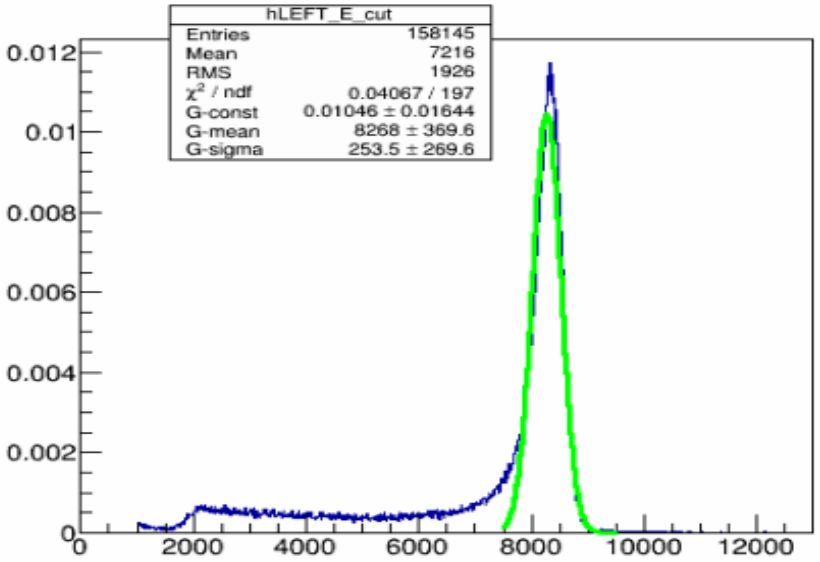
Note: discarded 9 out of 82 runs for failure to fit noisy down detector ToF-cut energy spectra --
Seems like for down detector, one-sigma time-of-flight cut cut away too much data.

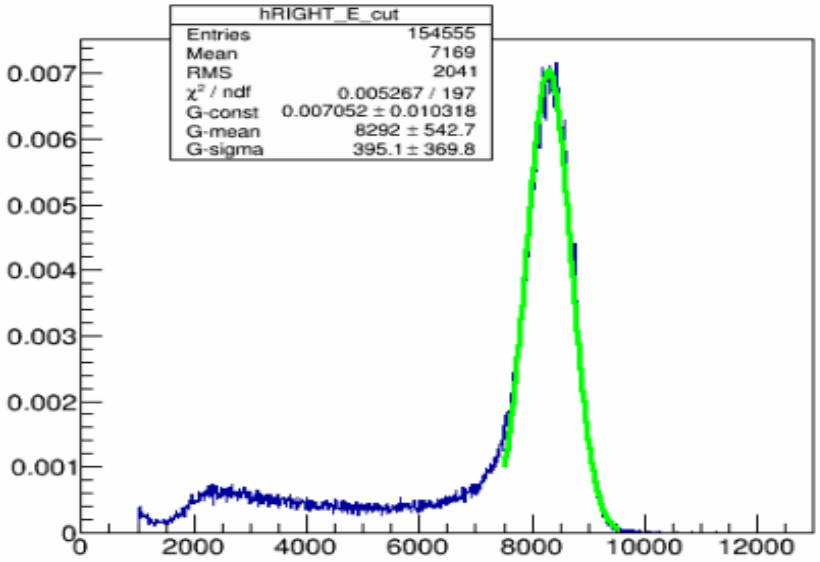
All discarded runs were on thick foils – foil 15 ~1000nm, 3 ~870nm, 4 ~750nm

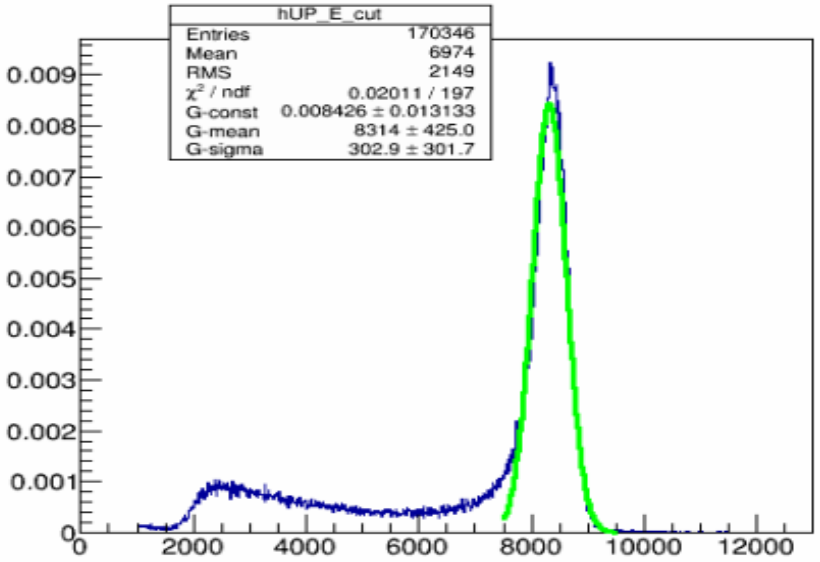
Thick Foil 15, ~1000 nm, Run 7999, ToF-cut mean +/- 2.0 * sigma

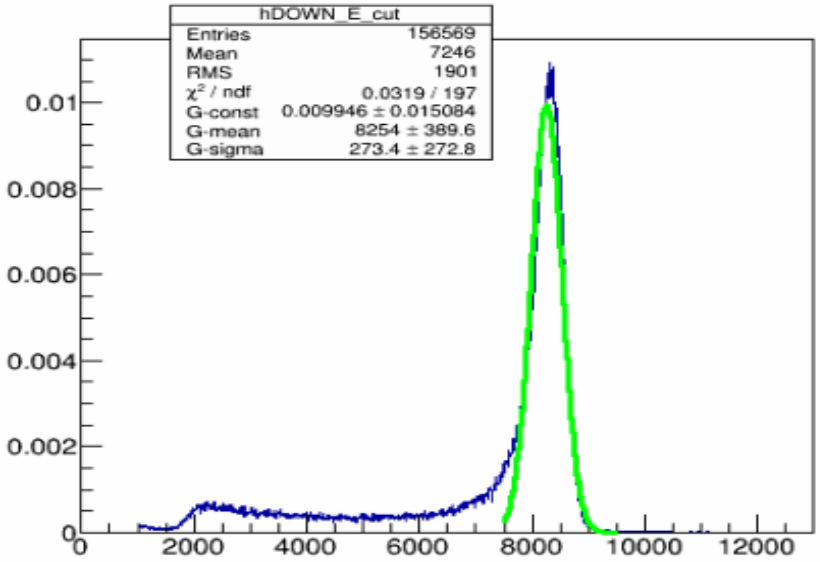


Medium Foil 5, ~500 nm, Run 8041, ToF-cut mean +/- 2.0 * sigma

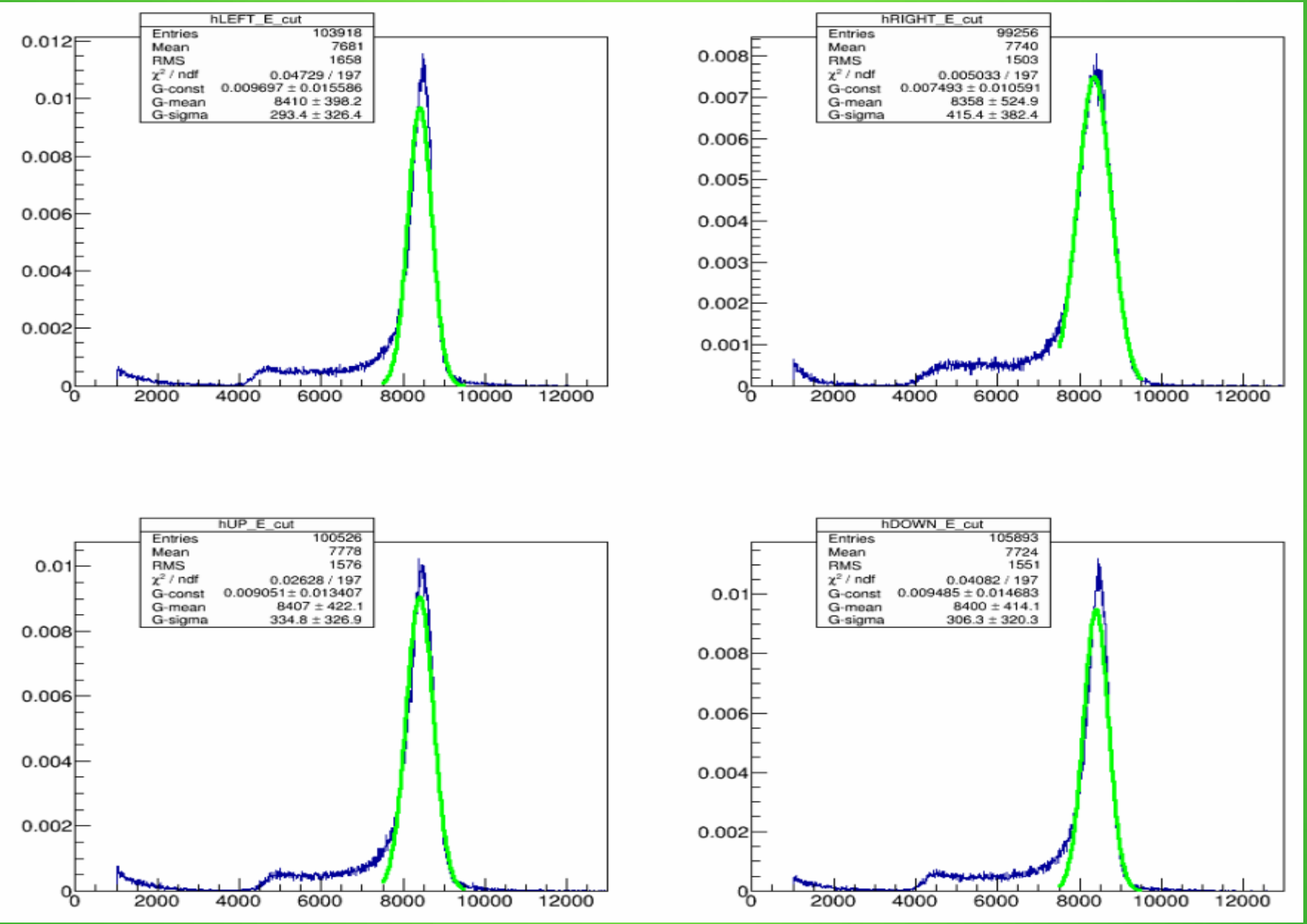




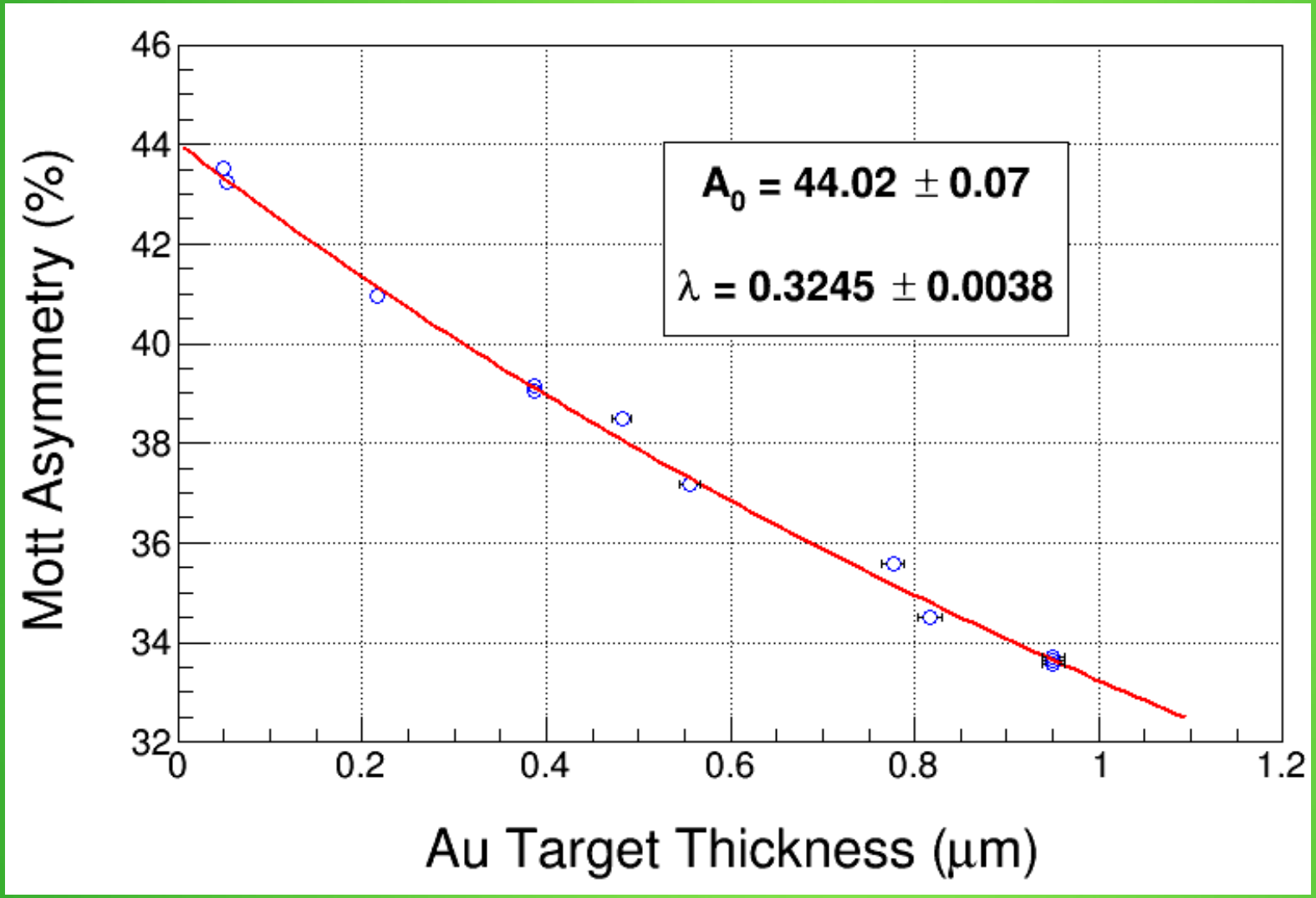




Thin Foil 12, ~50 nm, Run 8075, ToF-cut mean +/- 2.0 * sigma

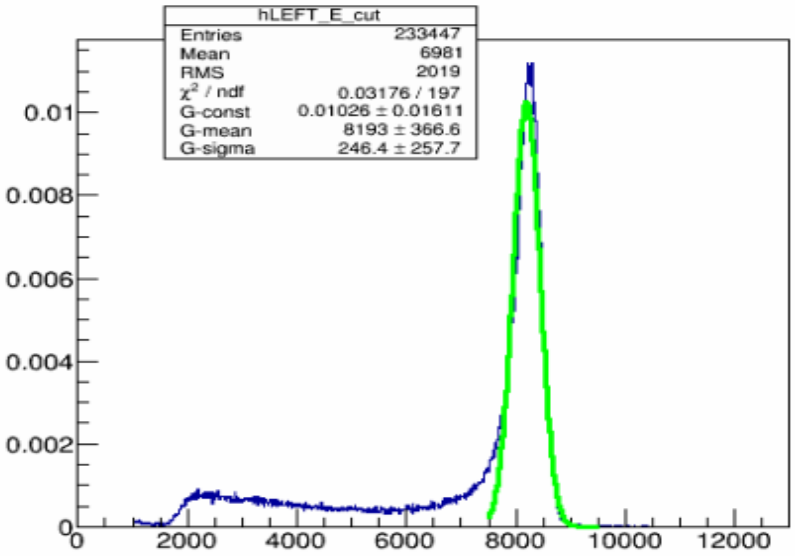


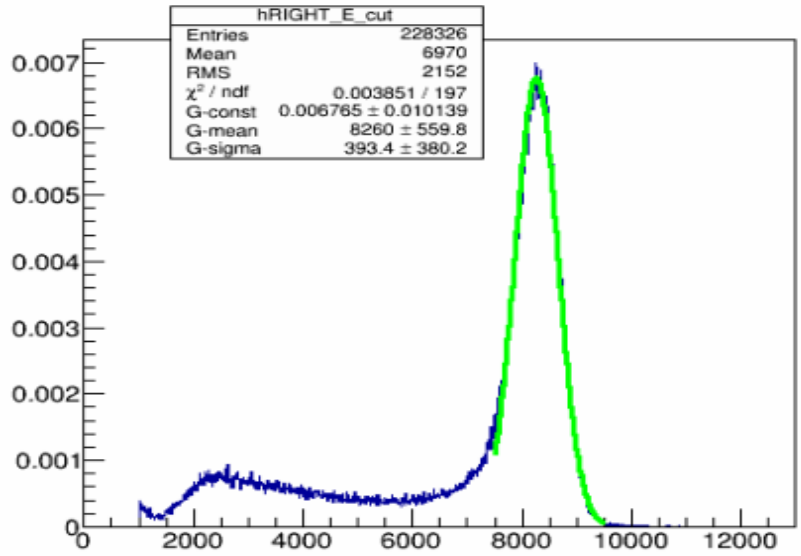
ToF-cut: mean +/- 2.0 * sigma
Energy cut: mean +/- 1.0 * sigma

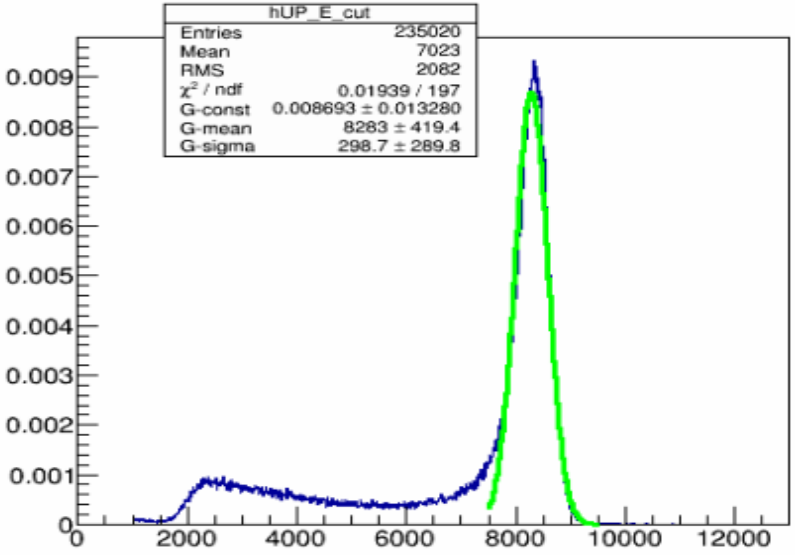


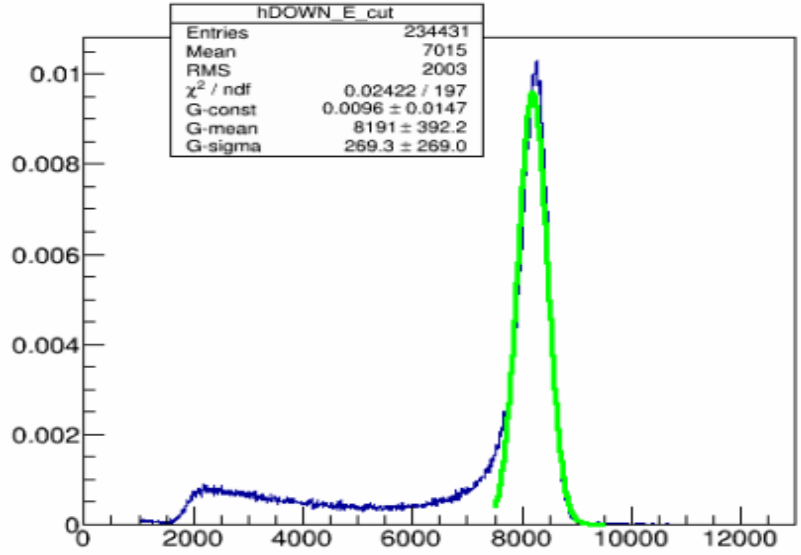
Note: No discarded runs

Thick Foil 15, ~1000 nm, Run 7999, ToF-cut mean +/- 3.0 * sigma

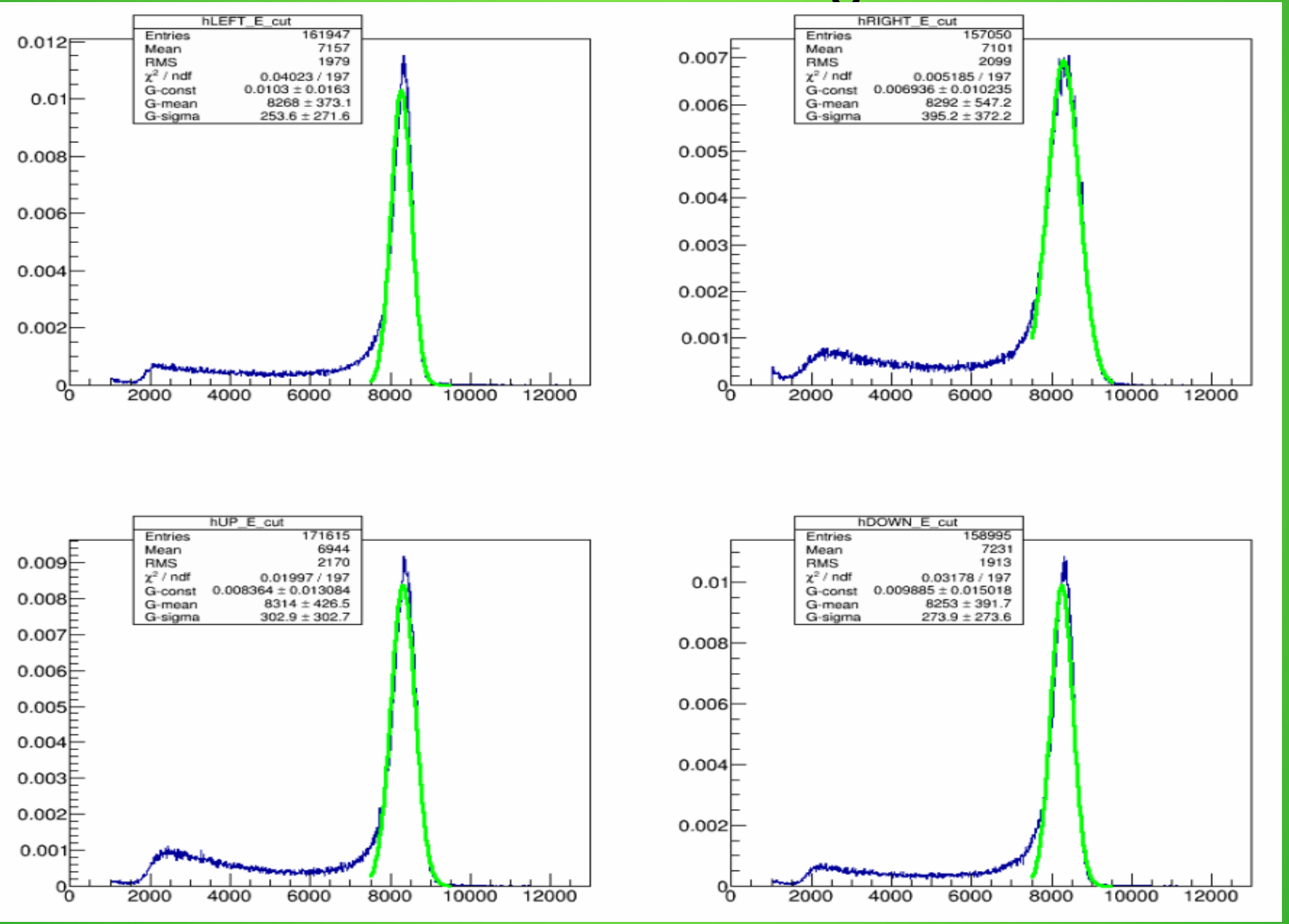




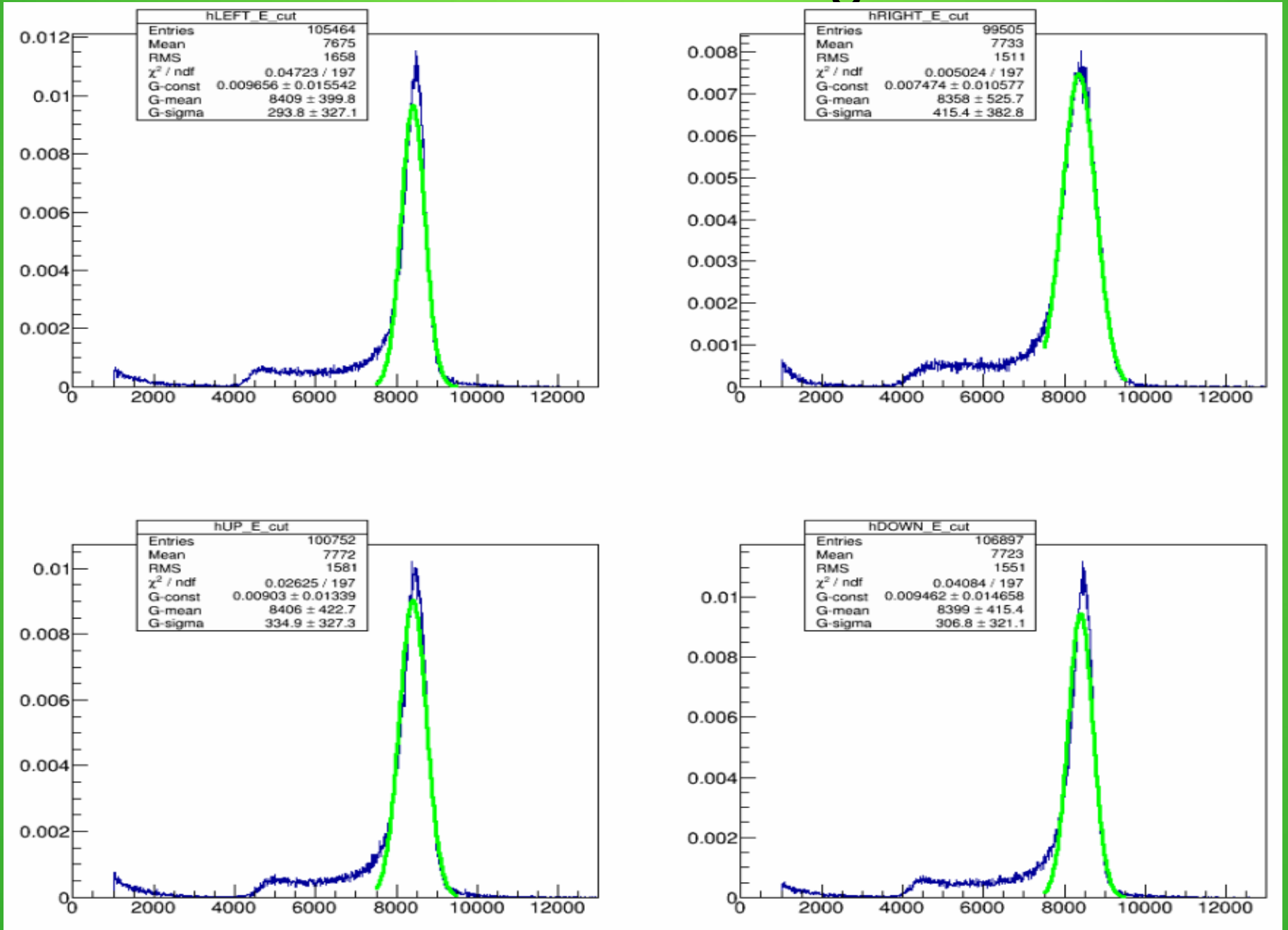




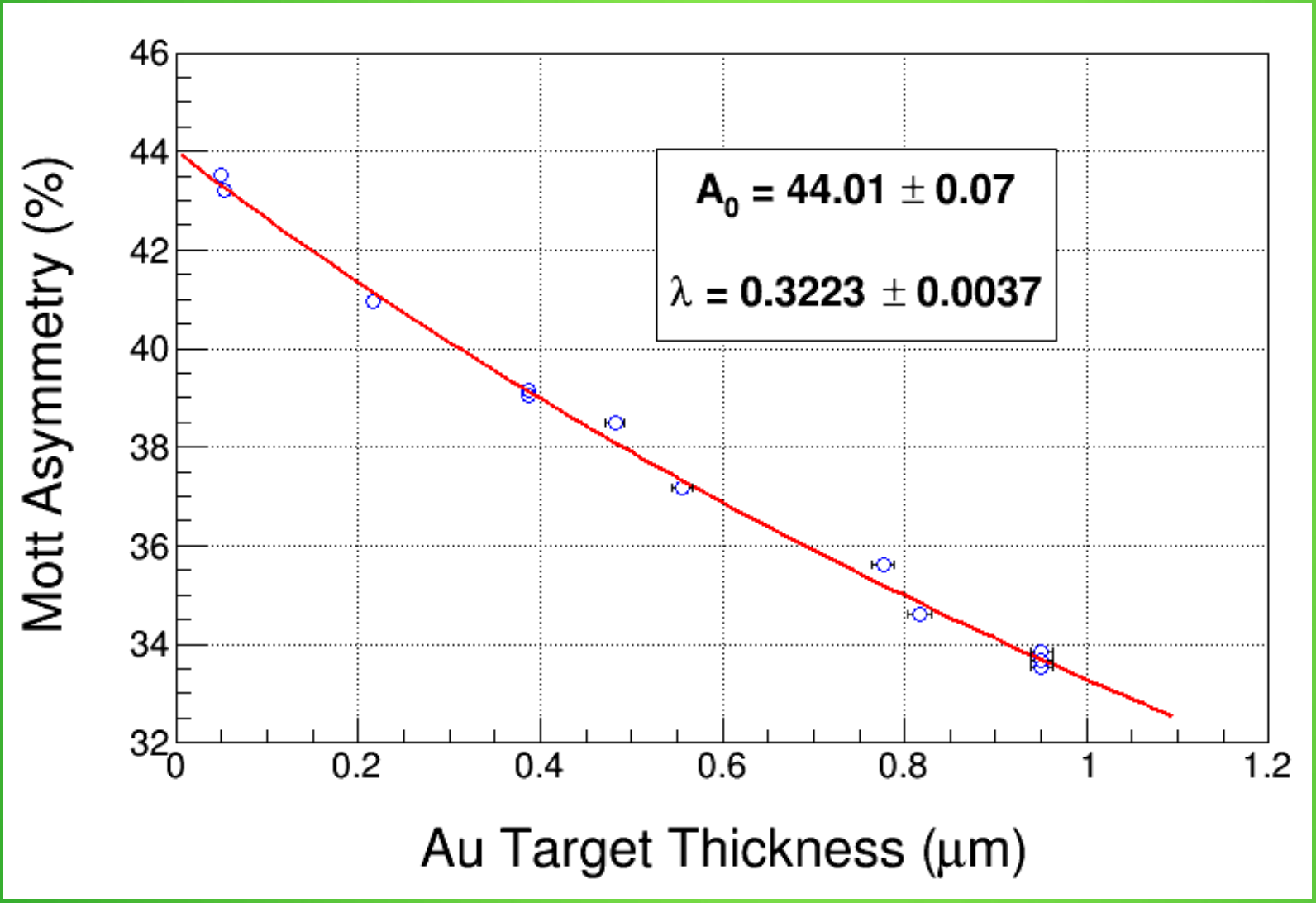
Medium Foil 5, ~500 nm, Run 8041, ToF-cut mean +/- 3.0 * sigma



Thin Foil 12, ~50 nm, Run 8075, ToF-cut mean +/- 3.0 * sigma

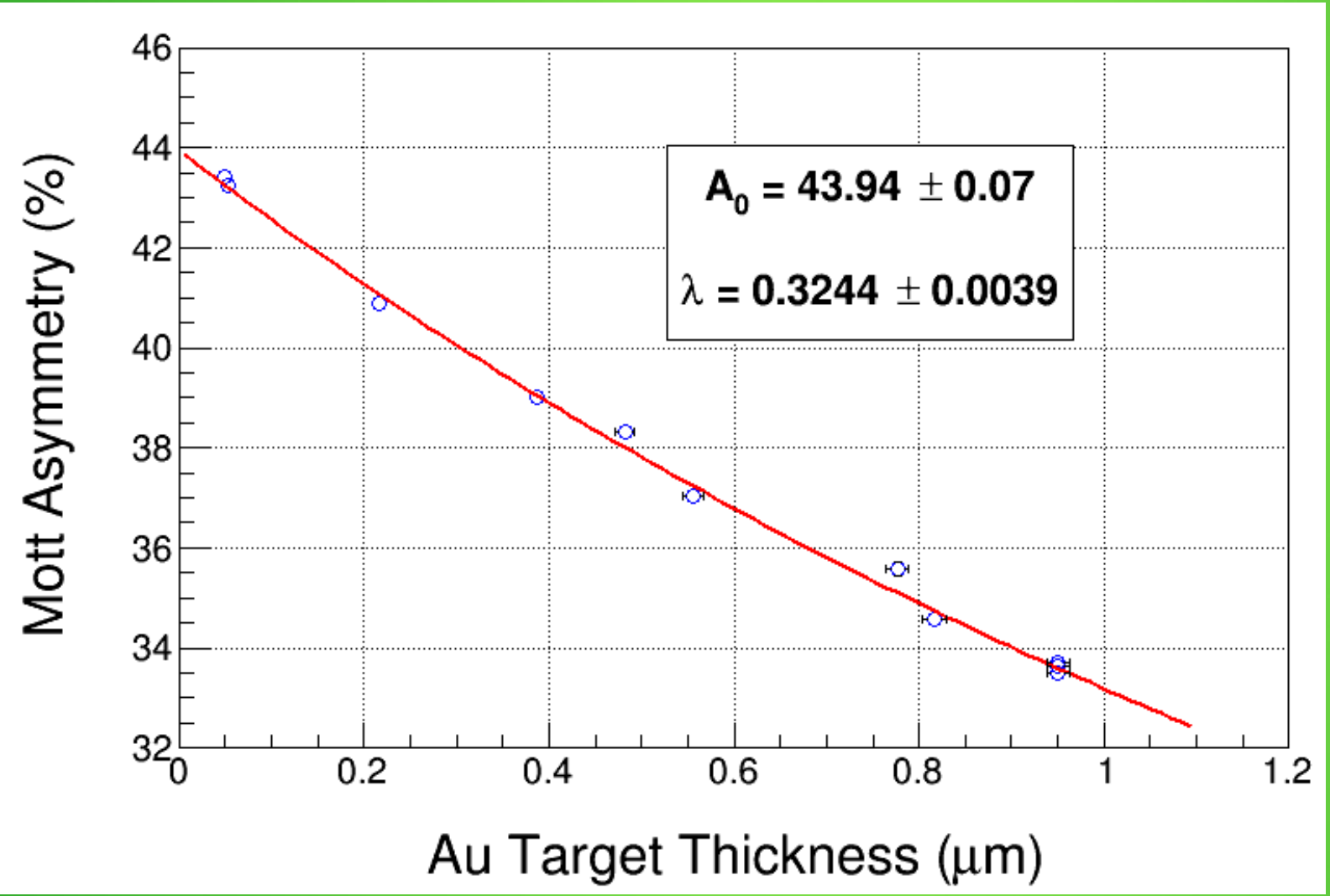


ToF-cut: mean +/- 3.0 * sigma
Energy cut: mean +/- 1.0 * sigma



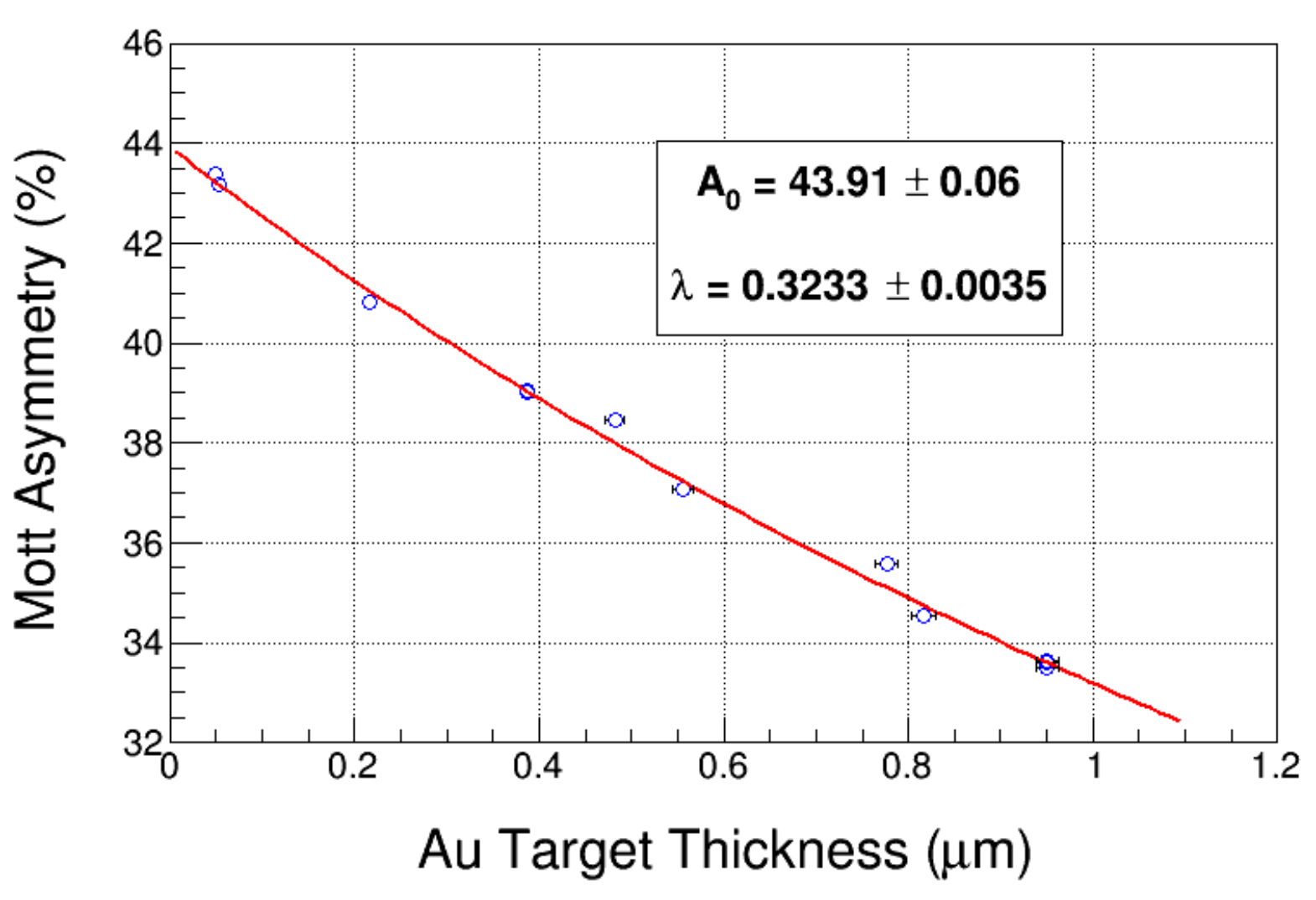
Note: No discarded runs

ToF-cut: mean +/- 1.0 * sigma
Energy cut: mean +/- 2.0 * sigma



Note: Discarded runs 8001, 8002, 8020, 8023, 8024, 8028, 8031, 8039, 8095

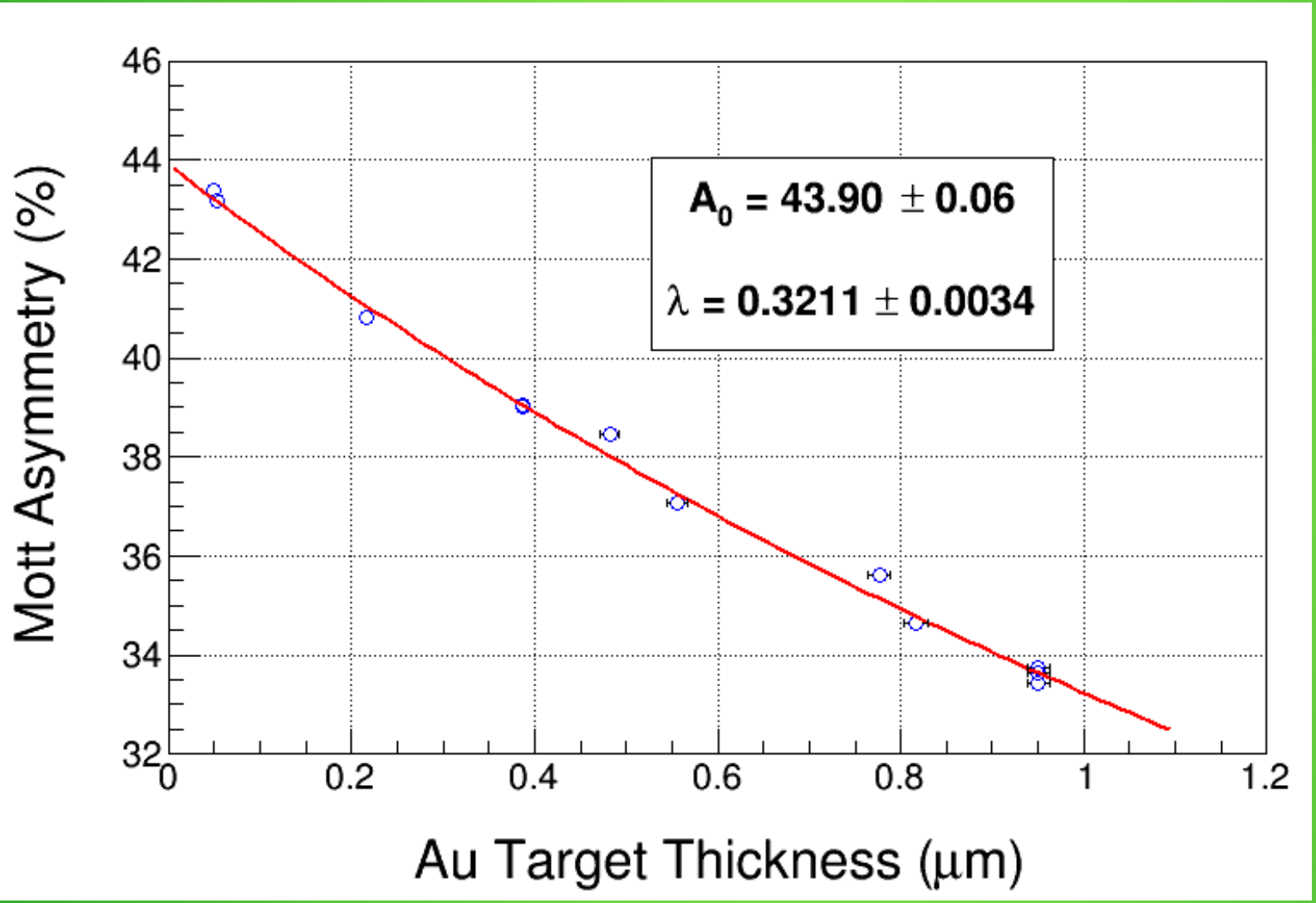
ToF-cut: mean +/- 2.0 * sigma
Energy cut: mean +/- 2.0 * sigma



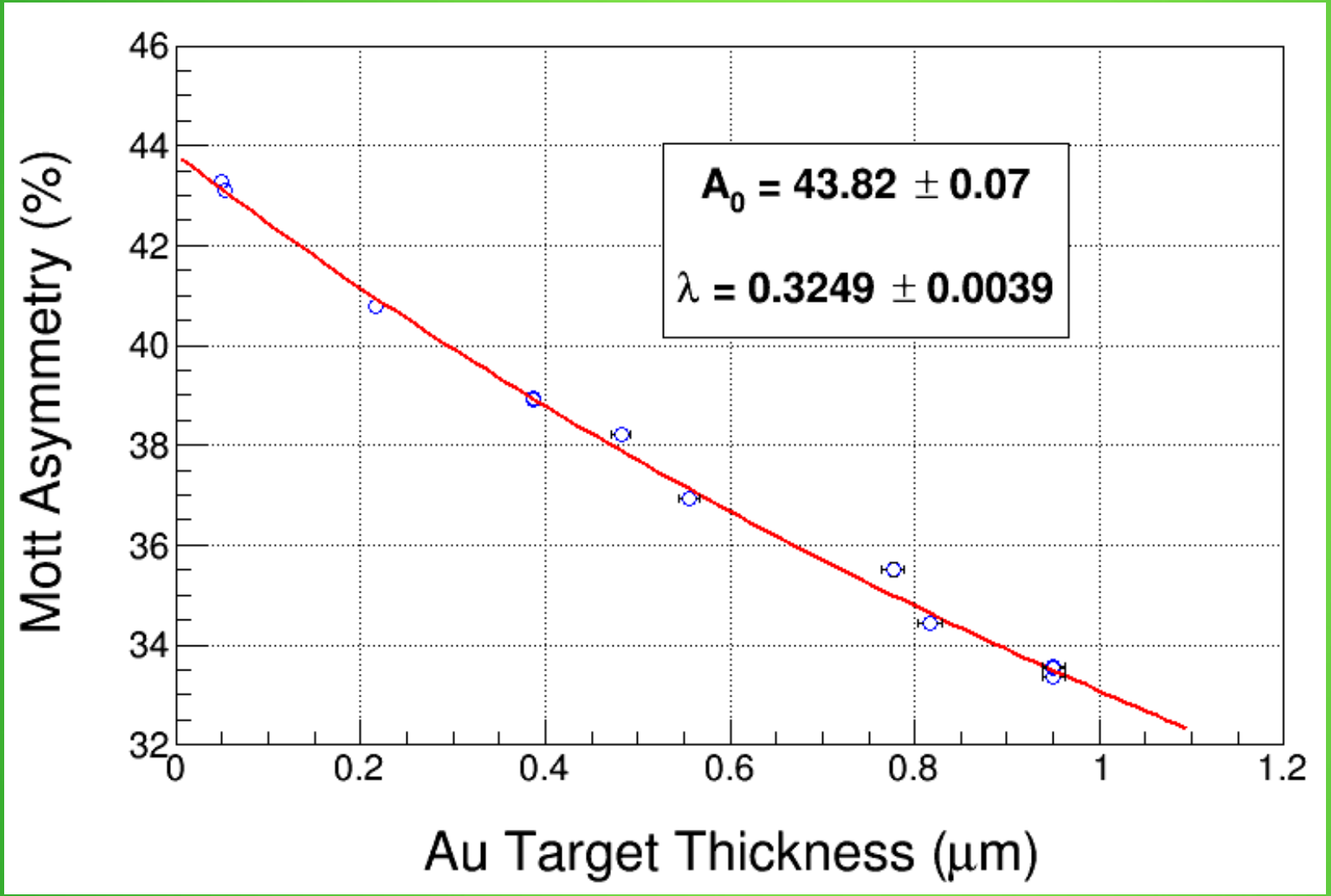
Note: No Runs discarded

ToF-cut: mean +/- 3.0 * sigma
Energy cut: mean +/- 2.0 * sigma

Note: No Runs discarded

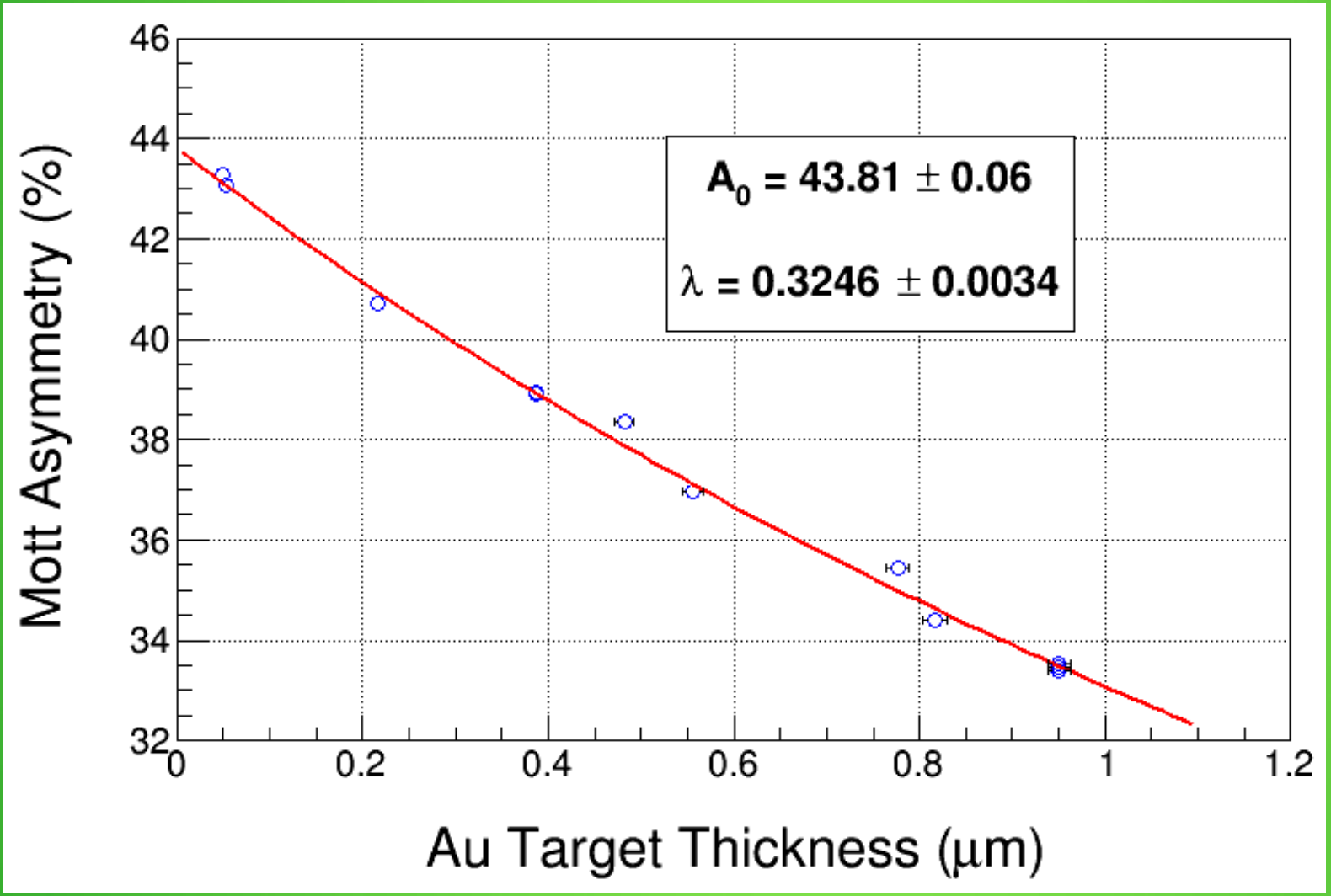


ToF-cut: mean +/- 1.0 * sigma
Energy cut: mean +/- 3.0 * sigma



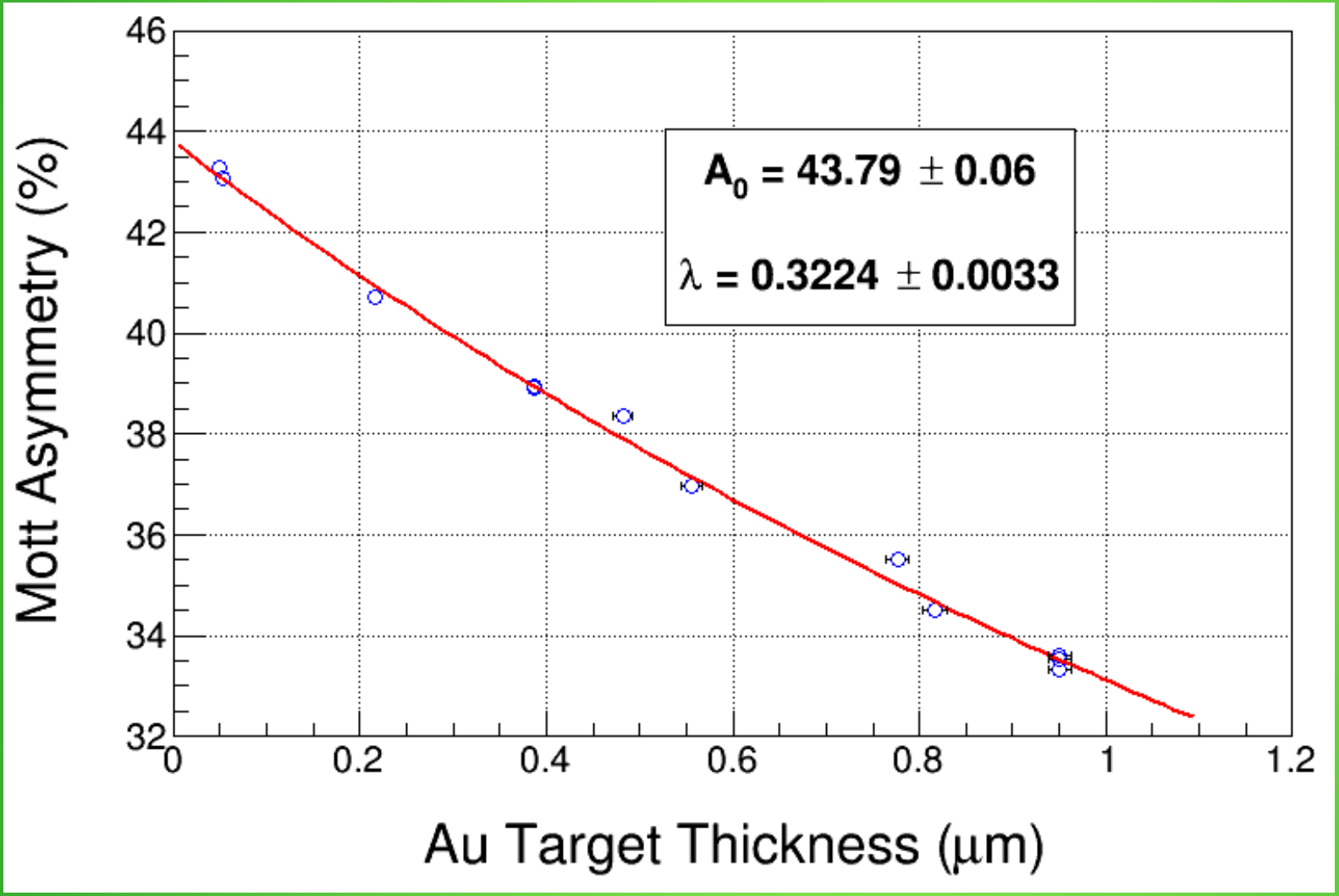
Note: Discarded runs 8001, 8002, 8020, 8023, 8024, 8028, 8031, 8039, 8095

ToF-cut: mean +/- 2.0 * sigma
Energy cut: mean +/- 3.0 * sigma



Note: No Runs discarded

ToF-cut: mean +/- 3.0 * sigma
Energy cut: mean +/- 3.0 * sigma



Note: No Runs discarded

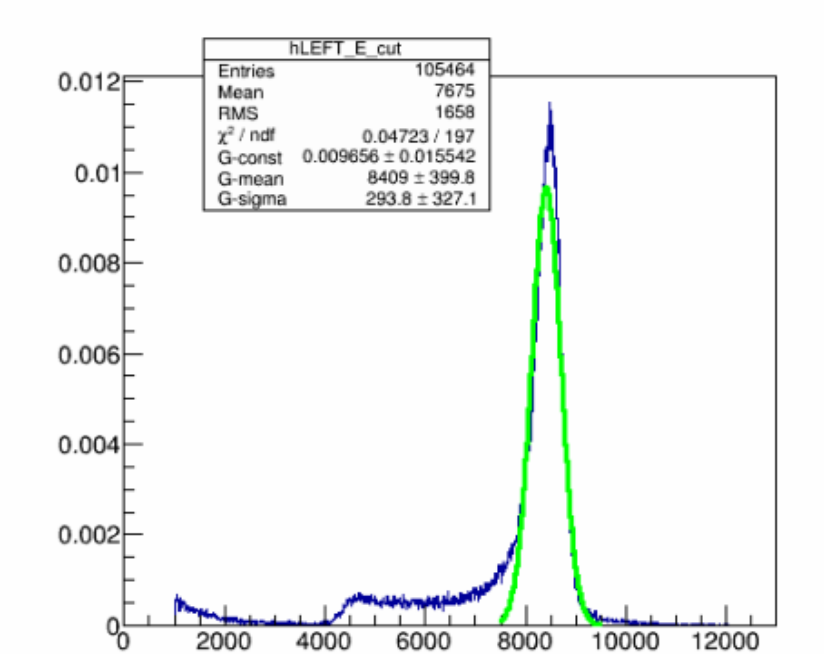
A_0 and Lambda vs Cuts

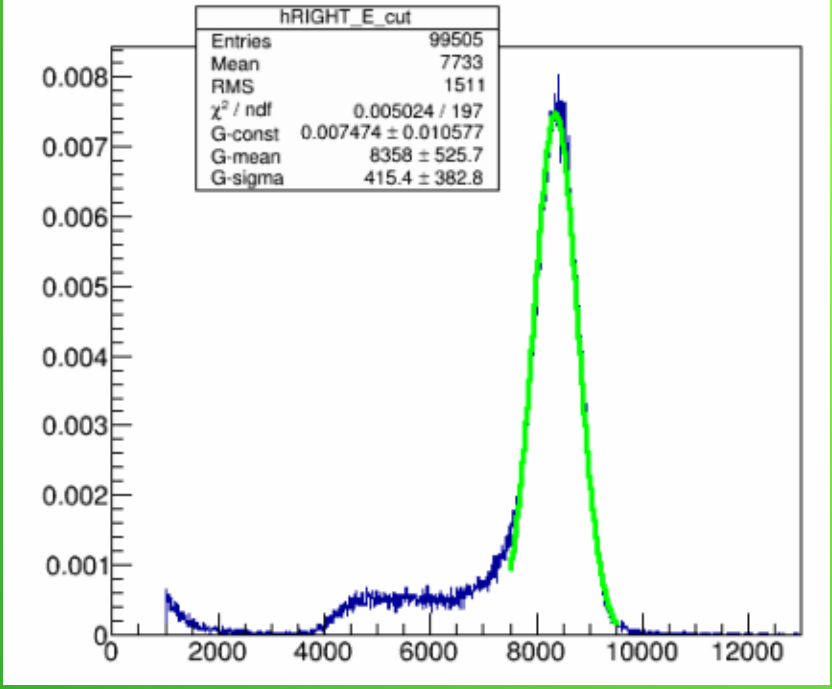
Energy Cut Mean +/- "X" sigma	Time-of-Flight Cut Mean +/- "X" *sigma	A_0	Lambda
1	1	44.01 +/- 0.08	0.3253 +/- 0.0043
1	2	44.02 +/- 0.07	0.3245 +/- 0.0038
1	3	44.01 +/- 0.07	0.3223 +/- 0.0037
2	1	43.94 +/- 0.07	0.3244 +/- 0.0039
2	2	43.91 +/- 0.06	0.3233 +/- 0.0035
2	3	43.90 +/- 0.06	0.3211 +/- 0.0034
3	1	43.82 +/- 0.07	0.3249 +/- 0.0039
3	2	43.81 +/- 0.06	0.3246 +/- 0.0034
3	3	43.79 +/- 0.06	0.3224 +/- 0.0033

Sensitivity of A_0 and lambda to systematic time-of-flight and energy cuts

- Perhaps need to increase multiples of sigma to find sensitivity edges – 4, 5, 6, ... 10? both for ToF and cut-Energy Spectra
- Study of asymmetry vs range for gaussian fit of cut energy spectra – used 7500:9500; increase, decrease
- Use of different function to fit Time-of-flight-cut energy spectra and then its parameters to determine energy cuts
- Fitting of background in time-of-flight-cut energy spectra (exponential? Linear?), subtracting function from spectra, observing result – does it look like Marty's curves?, fitting resulting energy spectra

Mott Run 1 Analysis





RECTIFYING THESE CURVES