

**Supplement to:**  
**Confined fission track revelation in apatite: how it works and  
why it matters**

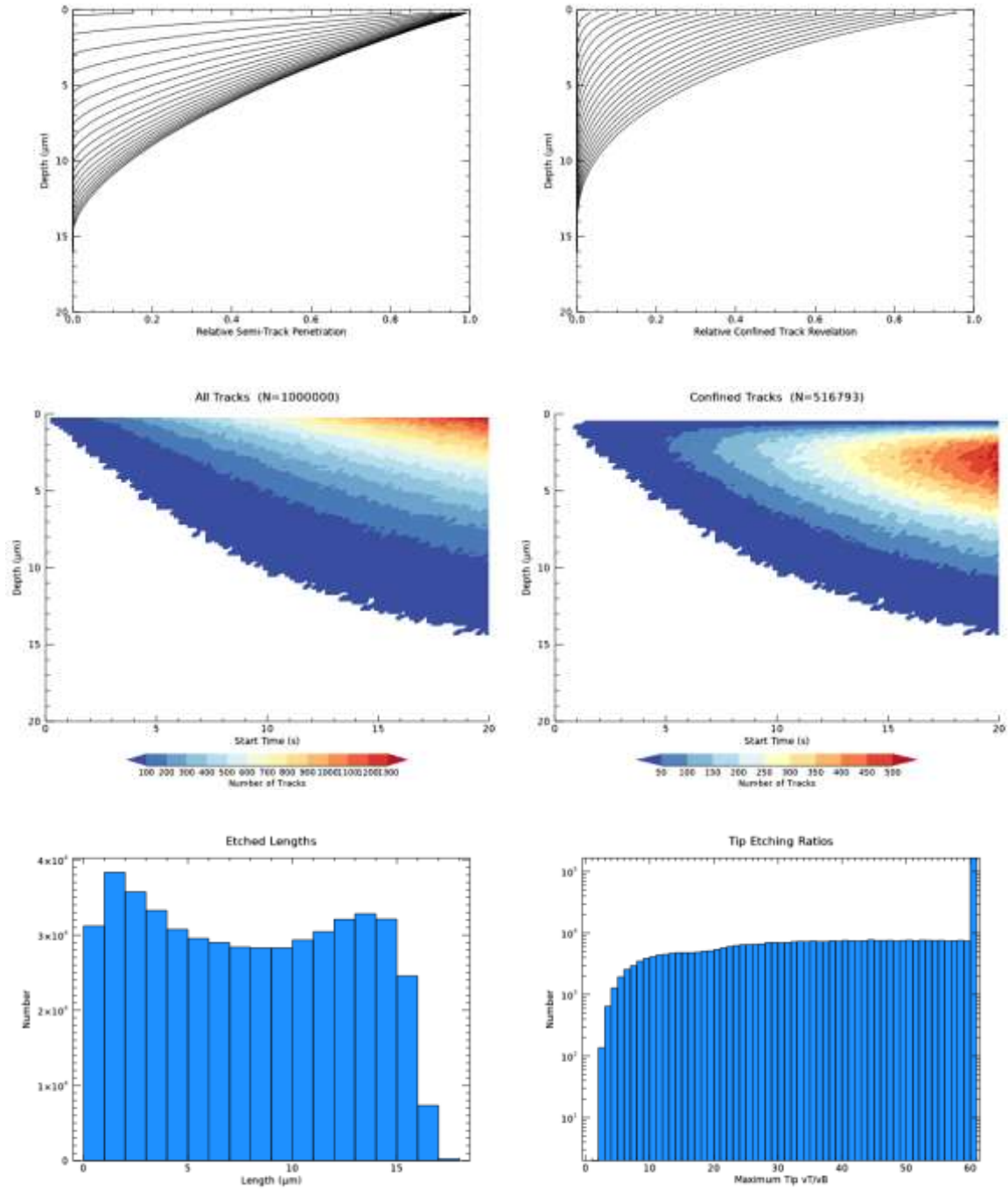
Richard A. Ketcham<sup>1</sup>, and Murat T. Tamer<sup>1</sup>

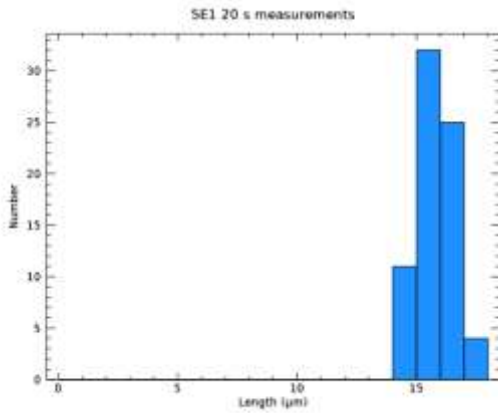
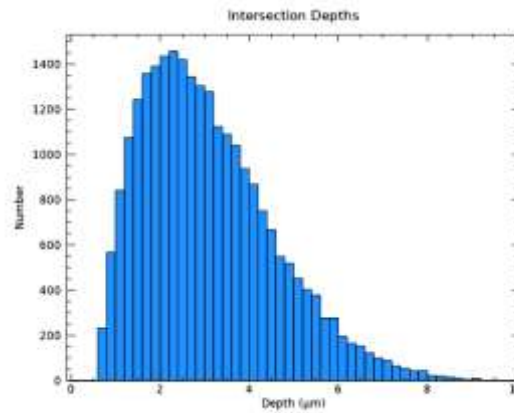
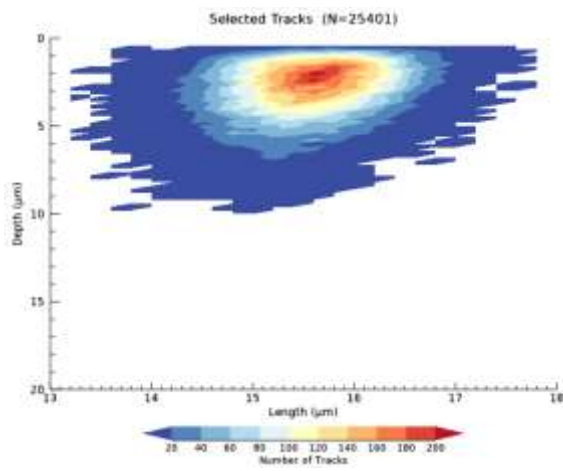
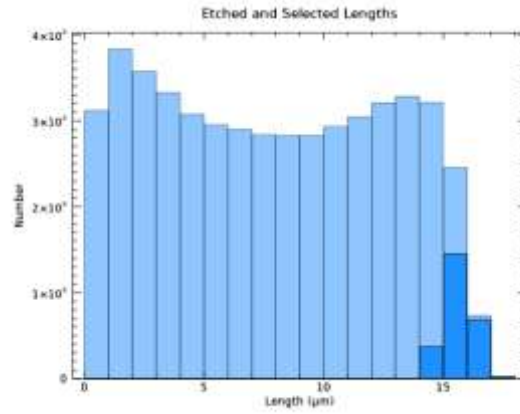
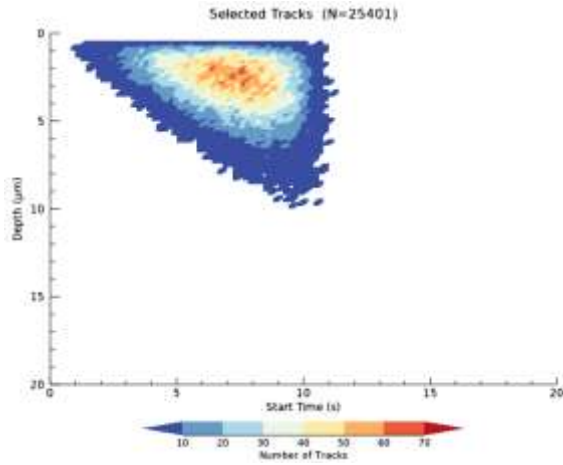
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This file contains model outputs for each data set fitted, using the diagrams demonstrated in Figures 3, 4, 6, and 7 of the manuscript. Also included are the plots of the measured track length histograms for the earliest etching steps, for comparison with model predictions, and the command line to run the model in the IDL code (see statement on Code Availability), and the text output for each etching step, as: mean length ( $\mu\text{m}$ ), standard deviation ( $\mu\text{m}$ ), number of tracks selected, mean latent length of selected tracks, mean starting time of etching  $t_s$  (s), and mean impingement depth  $z_{int}$  ( $\mu\text{m}$ ).

# SE1 20 s model



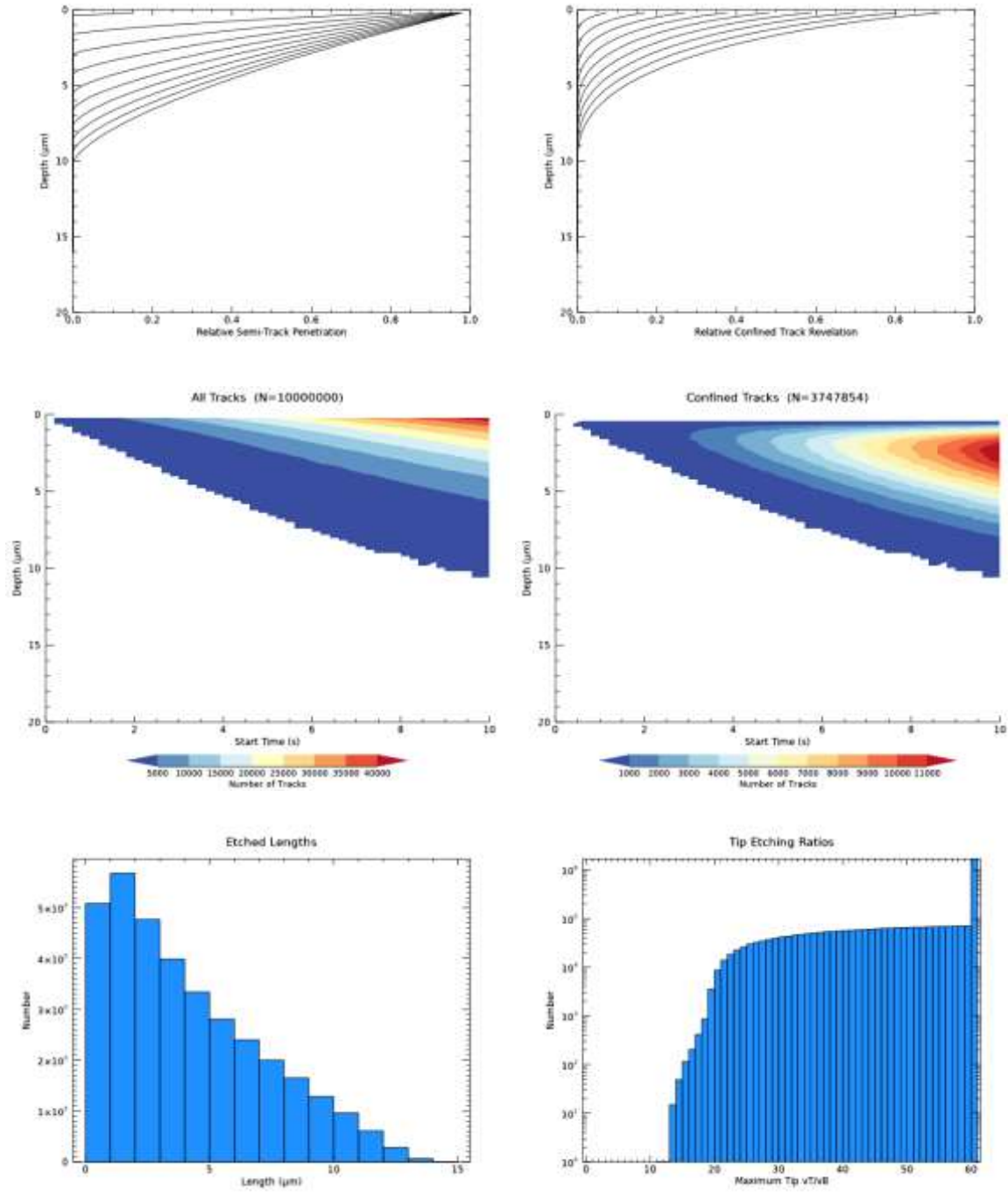


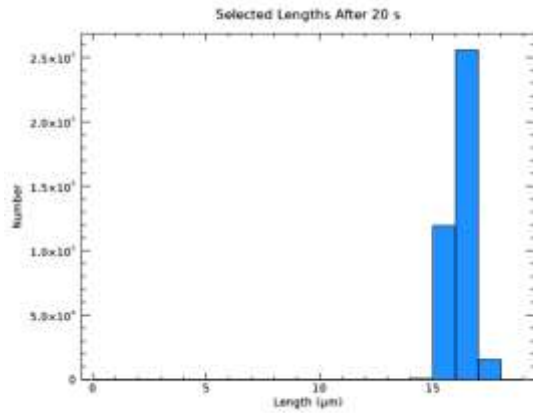
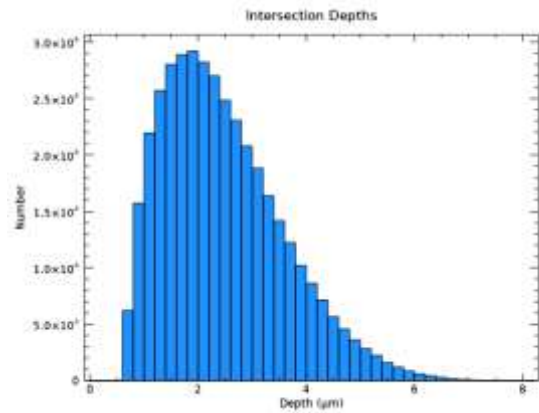
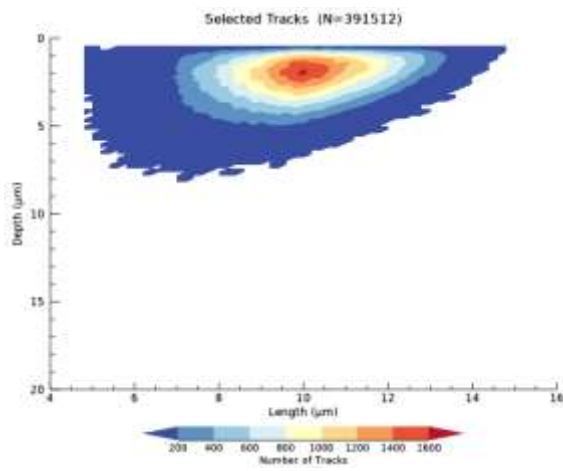
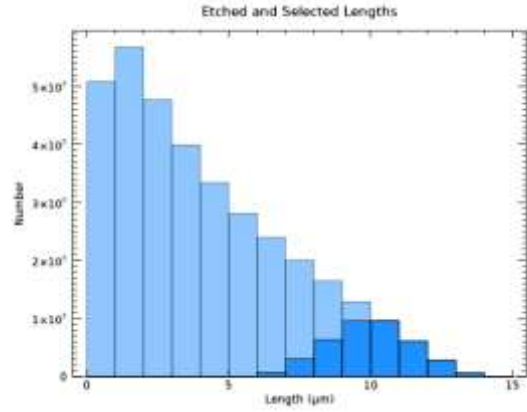
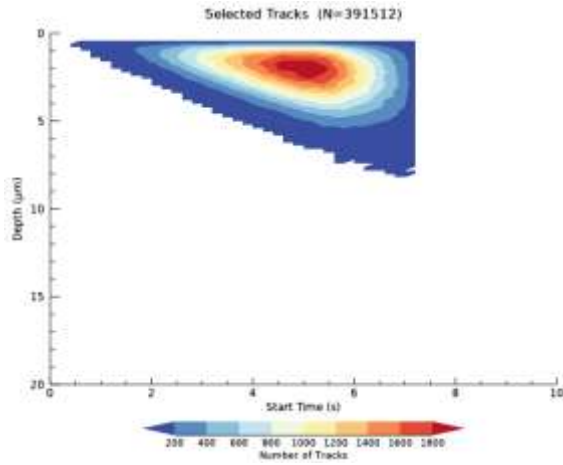
`GenerateTrackSet, 0.022, 1.33, 4.12, 6.42, /SHOW, NUM_TRACKS=100000L, DEPTH_INC=0.2, TIME_INC=0.2, MAX_TIP_VTVB=12., MAX_DIP=25., EX_TIP=2, UNDERETCH_BIAS=3., SD_LEN=0.5, STEPS=[20,25,30]`

Etch step	1	15.6357	0.599348	25401	16.8758	7.13211
2.98992						
Etch step	2	16.5698	0.487529	25401	16.8758	7.13211
2.98992						

Etch step	3	16.9290	0.488246	25401	16.8758	7.13211
2.98992						

# SE2 10 s model

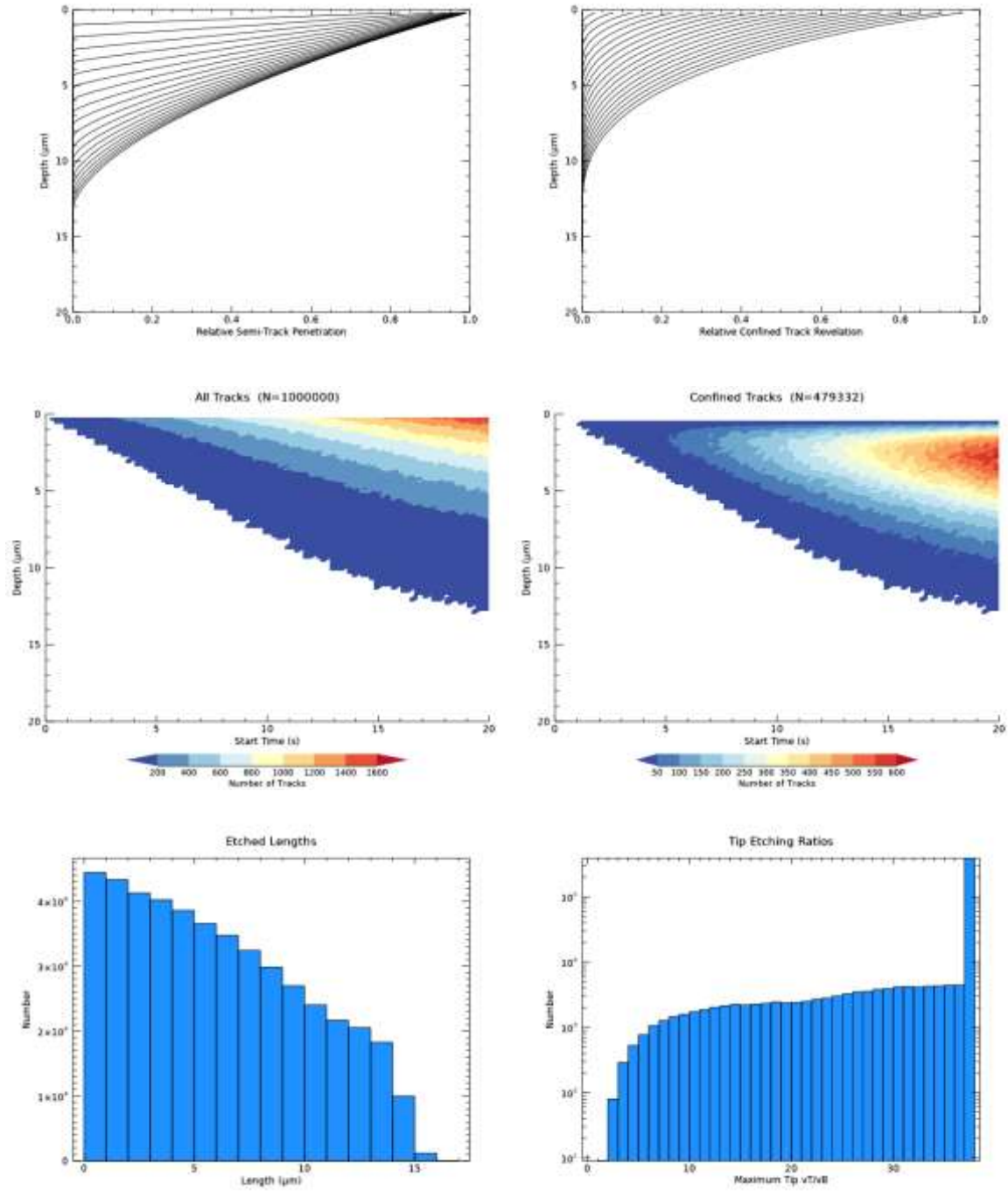


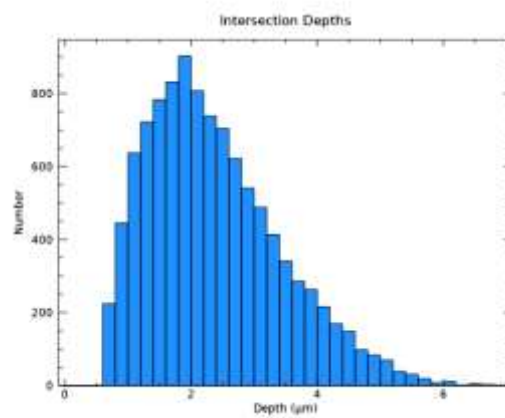
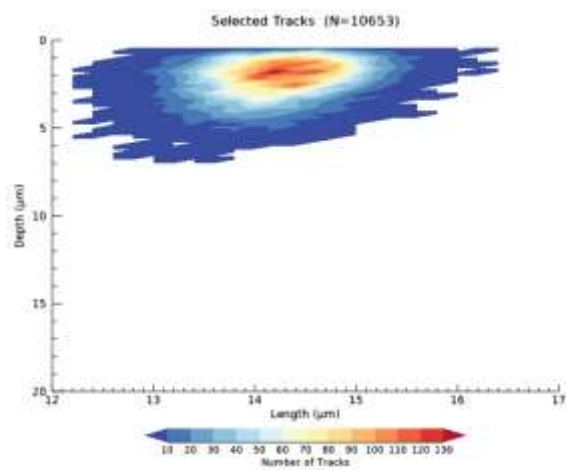
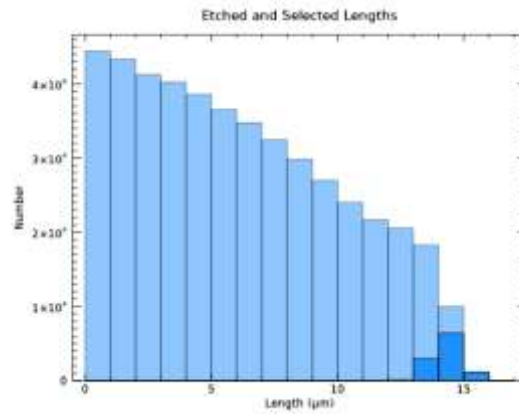
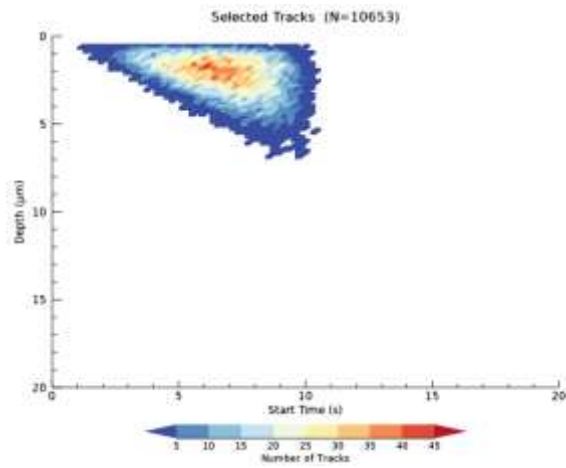


`GenerateTrackSet, 0.022, 1.33, 4.12, 6.42, /SHOW, NUM_TRACKS=1000000L,`  
`DEPTH_INC=0.2, TIME_INC=0.2, MAX_TIP_VTVB=12, MAX_DIP=25., EX_TIP=2,`  
`UNDERETCH_BIAS=3., SD_LEN=0.5, STEPS=[10,20]`

Etch step	1	9.96308	1.47764	391512	16.9518	4.87429
2.36341						
Etch step	2	16.2234	0.439429	391512	16.9518	4.87429
2.36341						

# TK20 20 s model



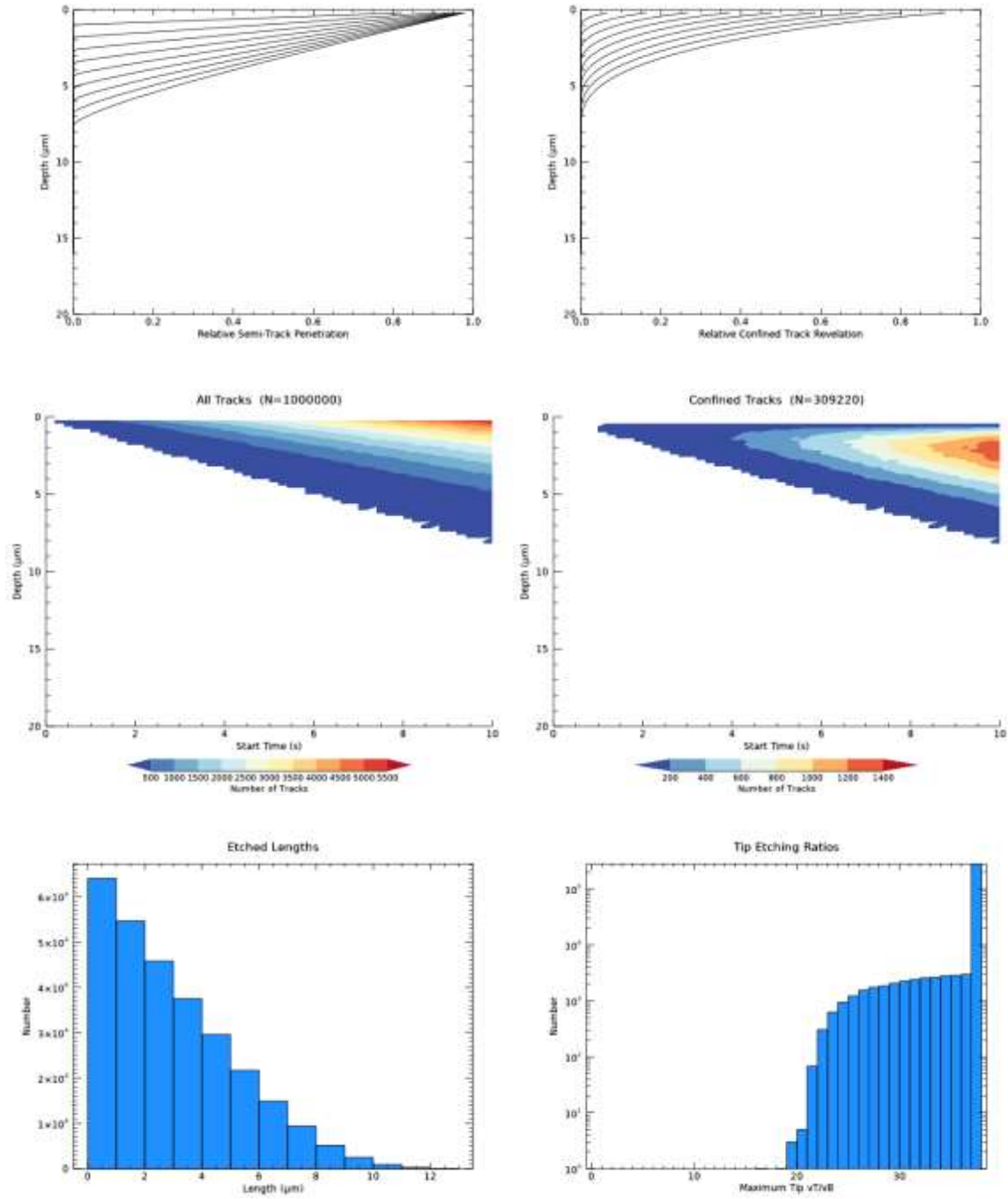


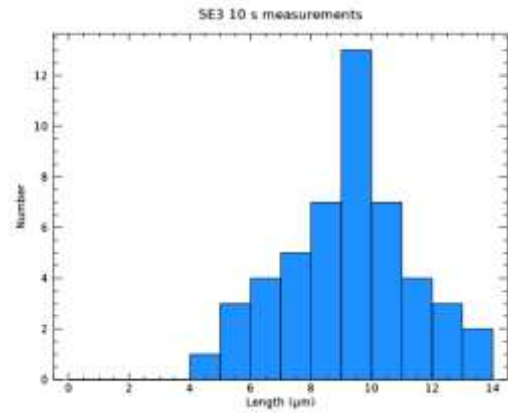
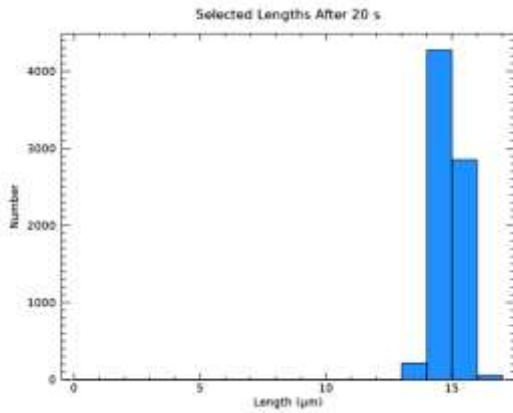
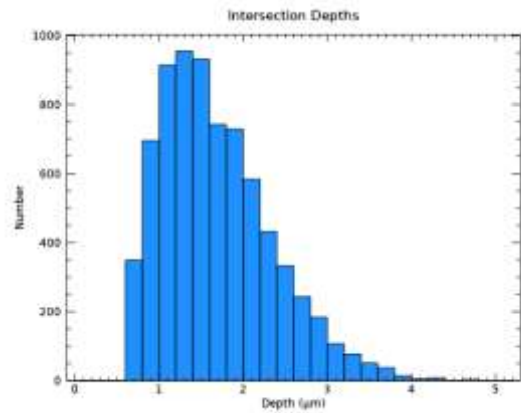
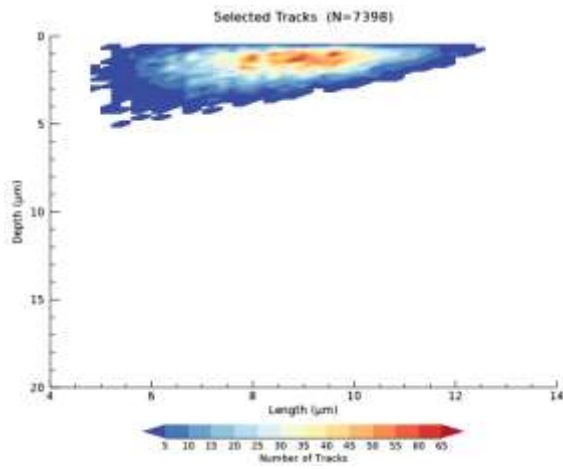
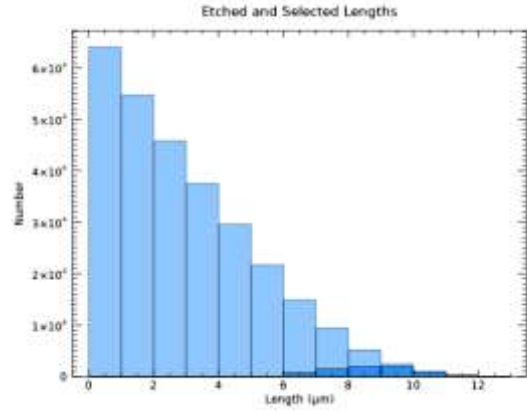
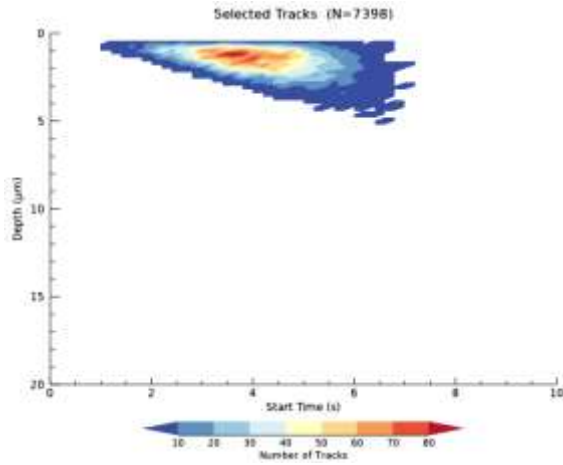
GenerateTrackSet, 0.022, 0.82, 8.68, 3.39, /SHOW, NUM\_TRACKS=100000L, DEPTH\_INC=0.2, TIME\_INC=0.2, MAX\_TIP\_VTVB=12., MAX\_DIP=25., EX\_TIP=2, UNDERETCH\_BIAS=3., SD\_LEN=0.5, STEPS=[20]

Etch step	1	14.3068	0.562050	10653	15.3389	6.73048
						2.26935



# SE3 10 s model



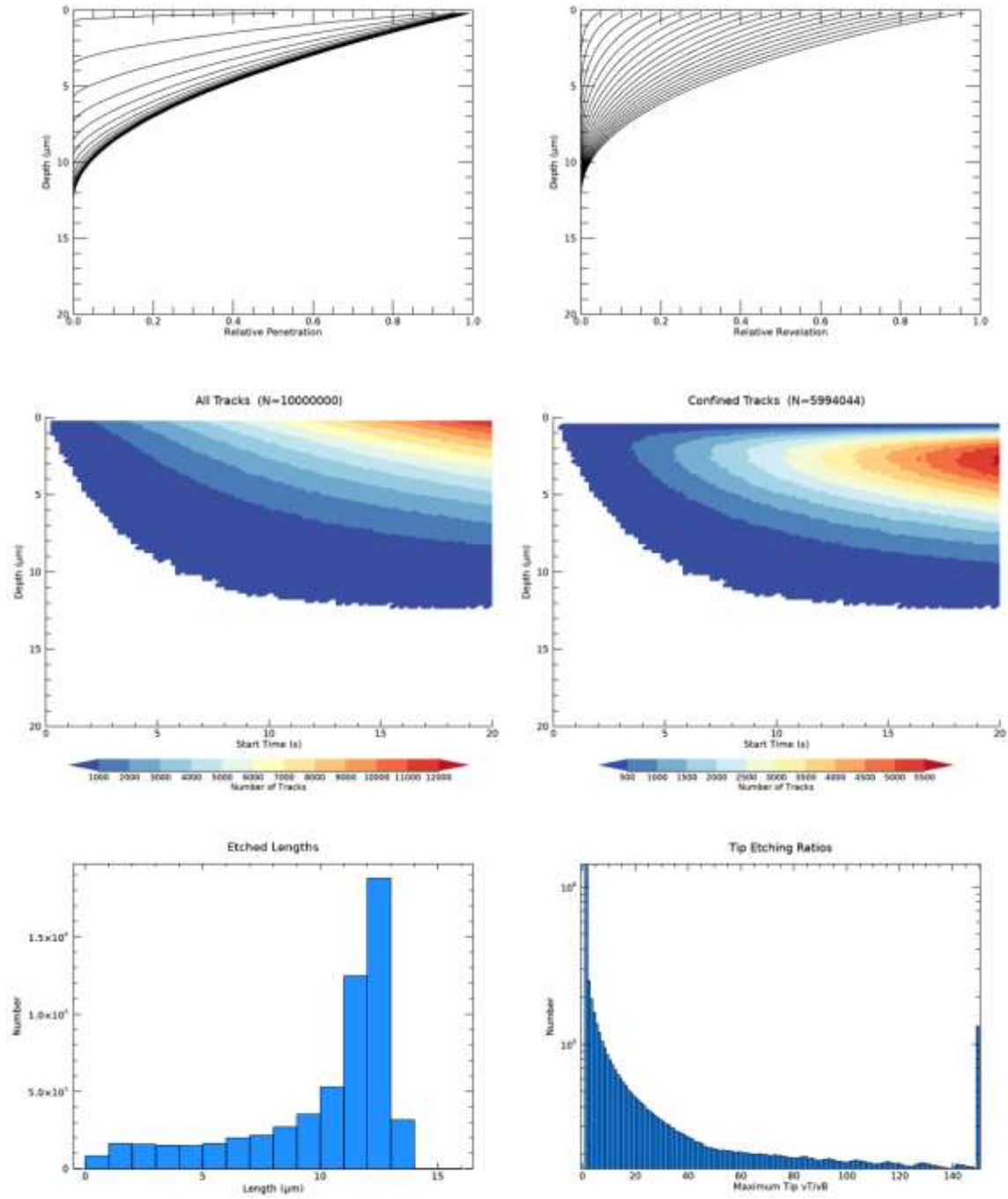


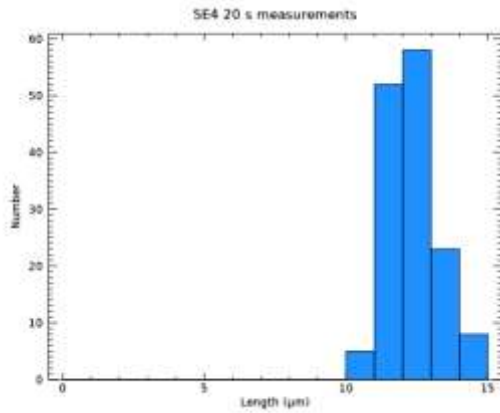
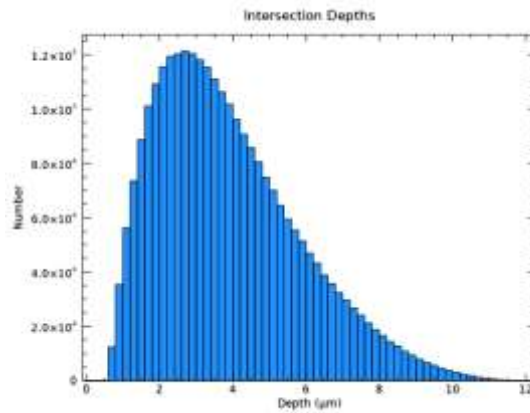
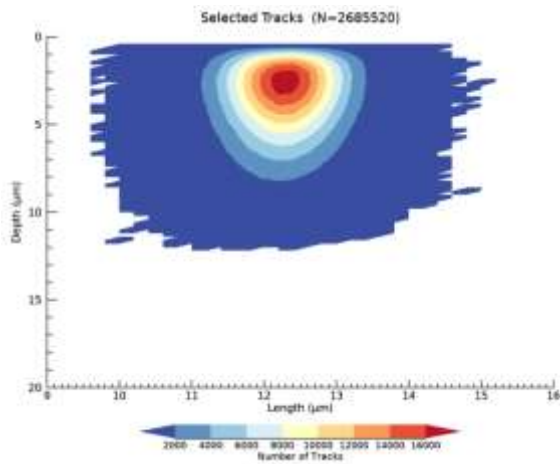
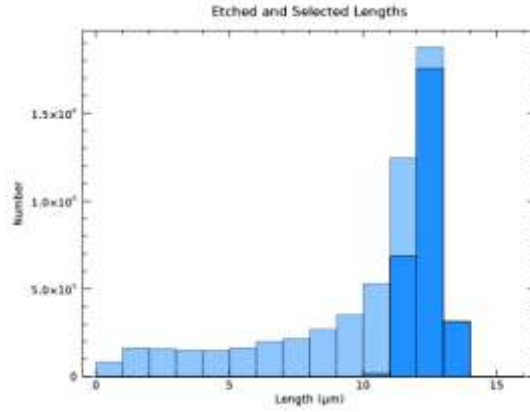
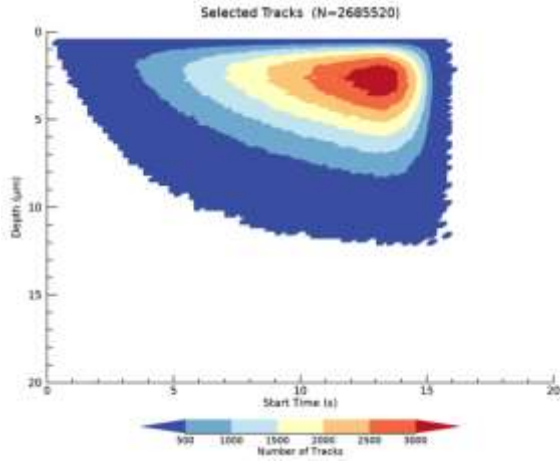
GenerateTrackSet, 0.022, 0.82, 8.68, 3.39, /SHOW, NUM\_TRACKS=100000L, DEPTH\_INC=0.2, TIME\_INC=0.2, MAX\_TIP\_VTVB=12., MAX\_DIP=25., EX\_TIP=2, UNDERETCH\_BIAS=3., SD\_LEN=0.5, STEPS=[10,15,20,25,30]

Etch step	1	8.64164	1.33711	7398	15.4482	4.16618
1.58113						
Etch step	2	13.1872	0.787782	7398	15.4482	4.16618
1.58113						

Etch step 1.58113	3	14.8779	0.457374	7398	15.4482	4.16618
Etch step 1.58113	4	15.4222	0.459937	7398	15.4482	4.16618
Etch step 1.58113	5	15.6759	0.470190	7398	15.4482	4.16618

# SE4 20 s model

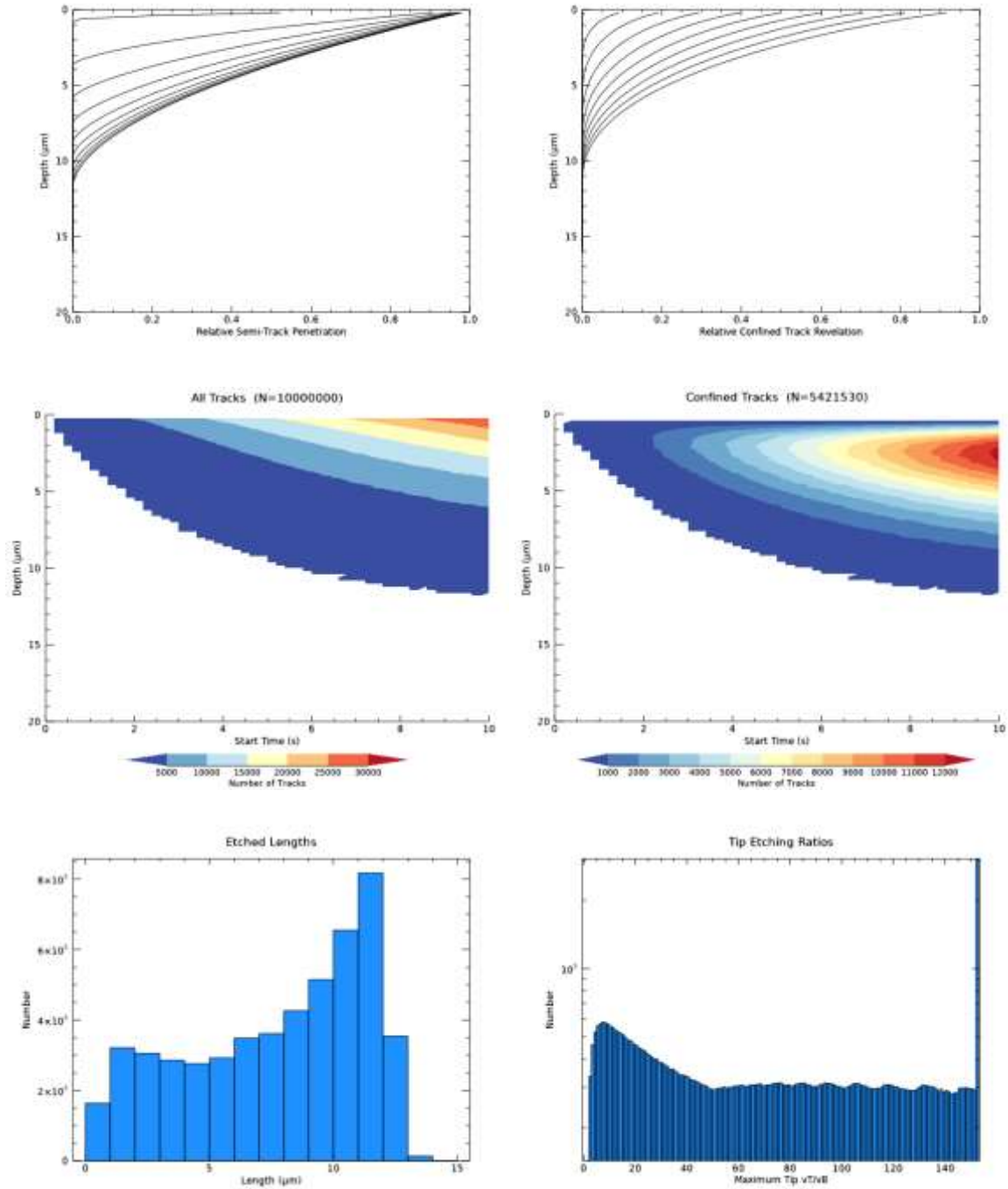


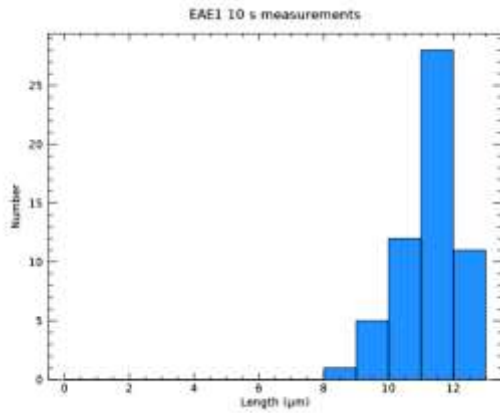
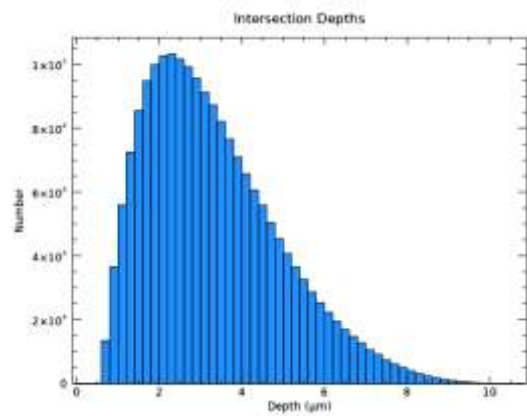
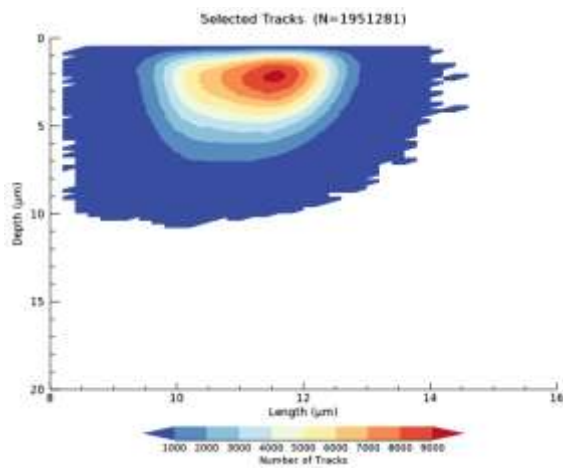
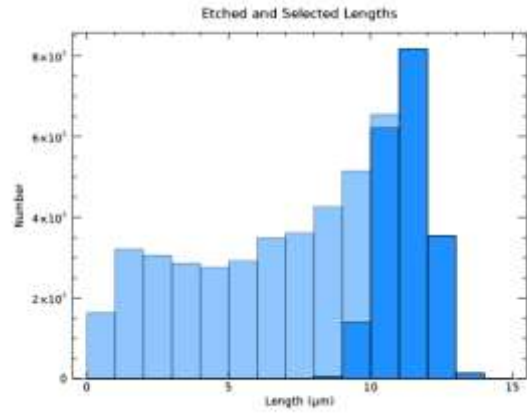
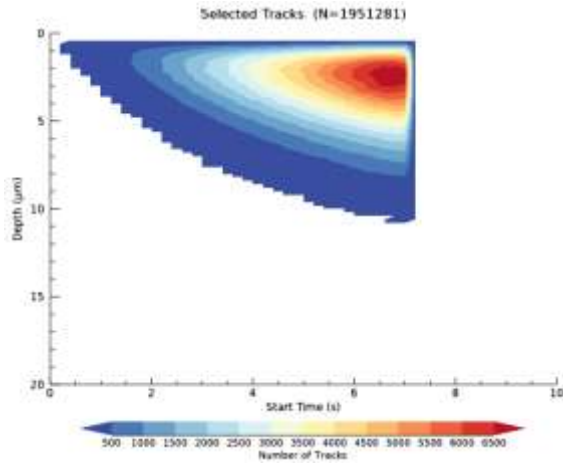


GenerateTrackSet, 0.022, 3.357, 0.76, 5.84, /SHOW, NUM\_TRACKS=1000000L,  
 DEPTH\_INC=0.2, TIME\_INC=0.2, MAX\_TIP\_VTVB=12, MAX\_DIP=25., EX\_TIP=2,  
 UNDERETCH\_BIAS=3., SD\_LEN=0.5

Etch step	1	12.3692	0.537919	268520	12.4435
	10.6107	3.76243			

# EAE1 10 s model

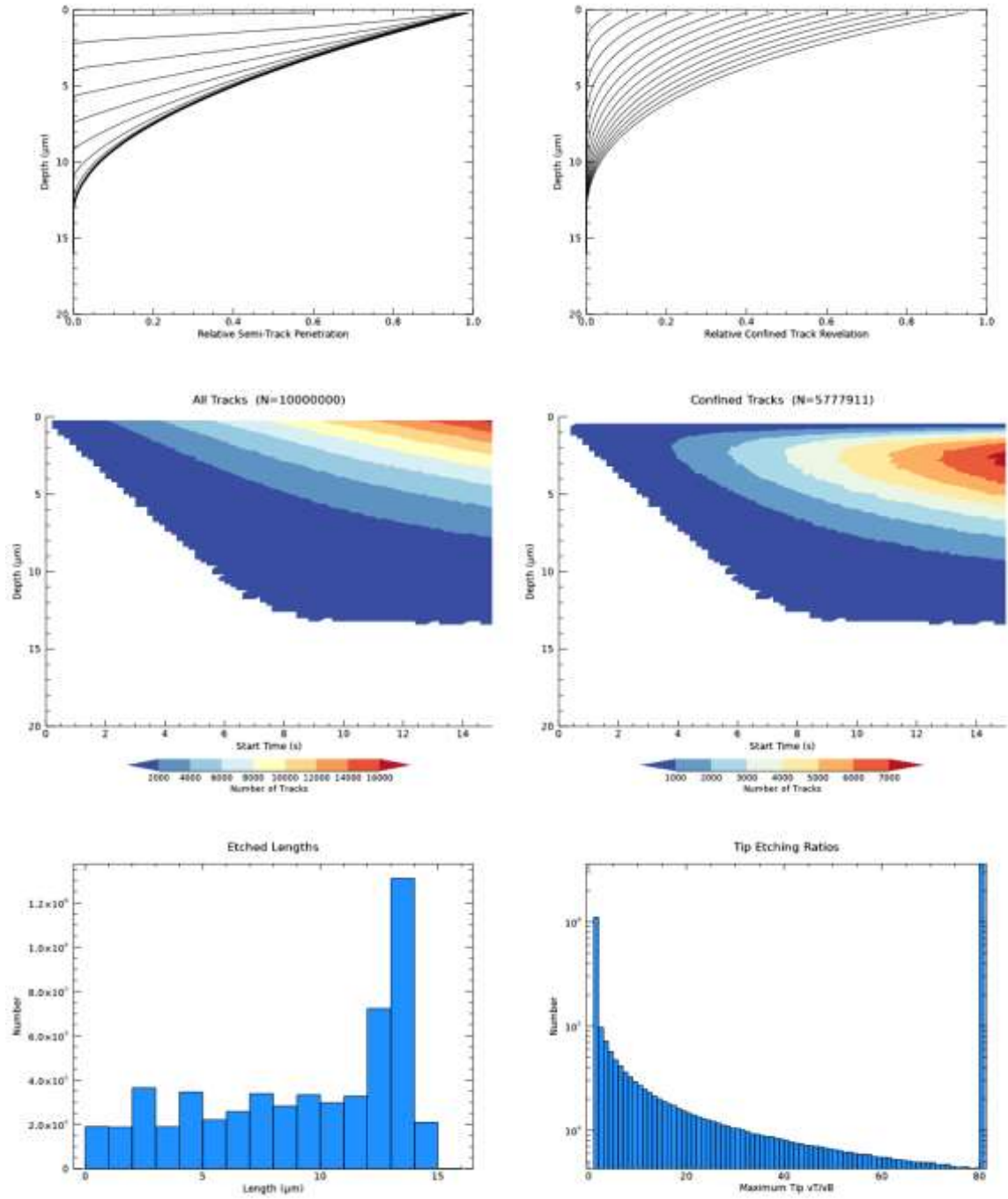




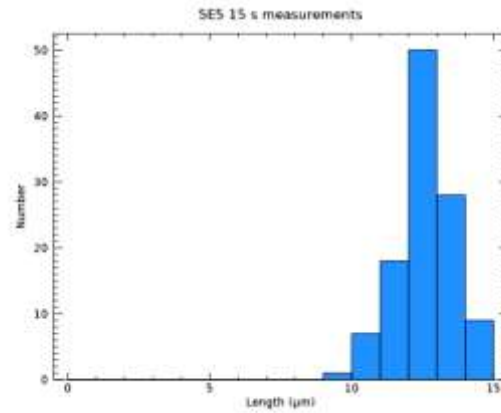
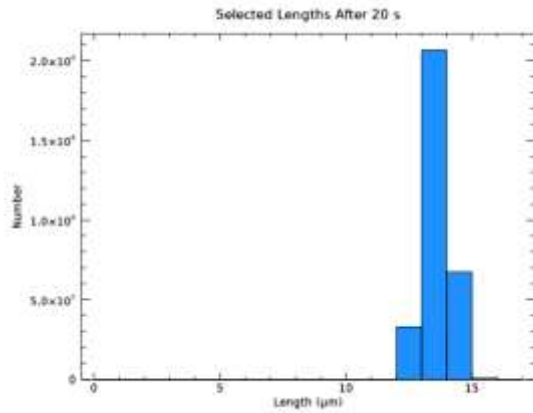
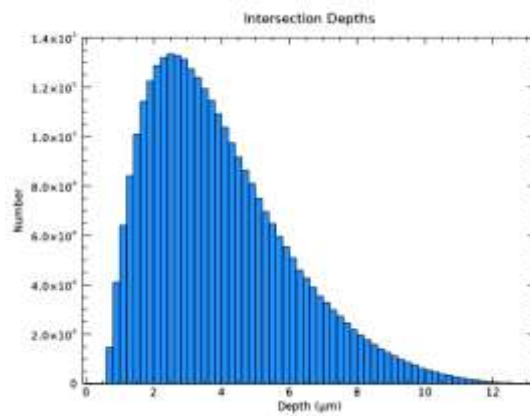
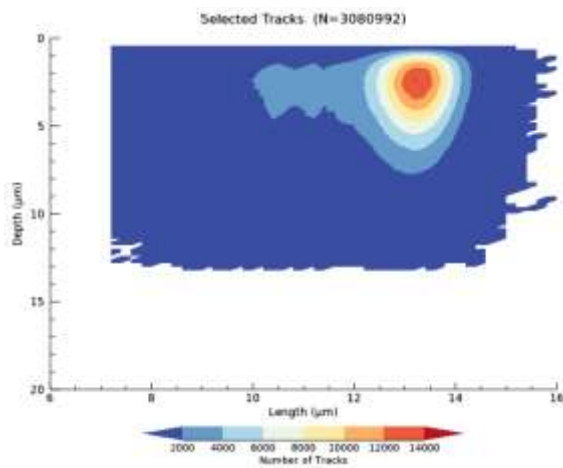
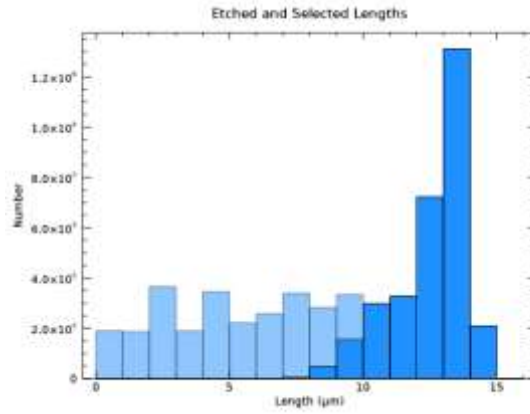
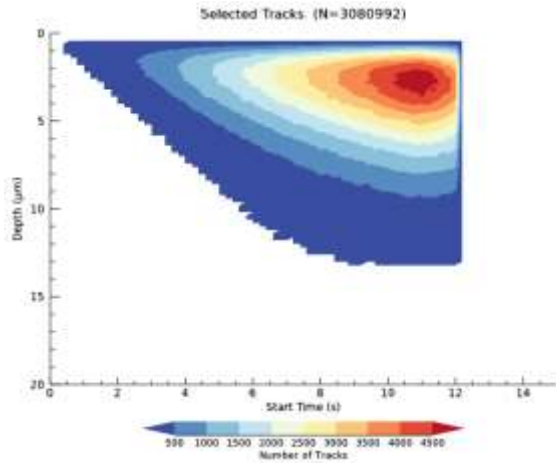
`GenerateTrackSet, 0.022, 3.357, 0.76, 5.84, /SHOW, NUM_TRACKS=1000000L,`  
`DEPTH_INC=0.2, TIME_INC=0.2, MAX_TIP_VTVB=12., MAX_DIP=25., EX_TIP=2,`  
`UNDERETCH_BIAS=3., SD_LEN=0.5, STEPS=[10]`

Etch step            1            11.2214            0.827352            1951281            12.4341            5.36634  
 3.20910

# SE5 15 s model





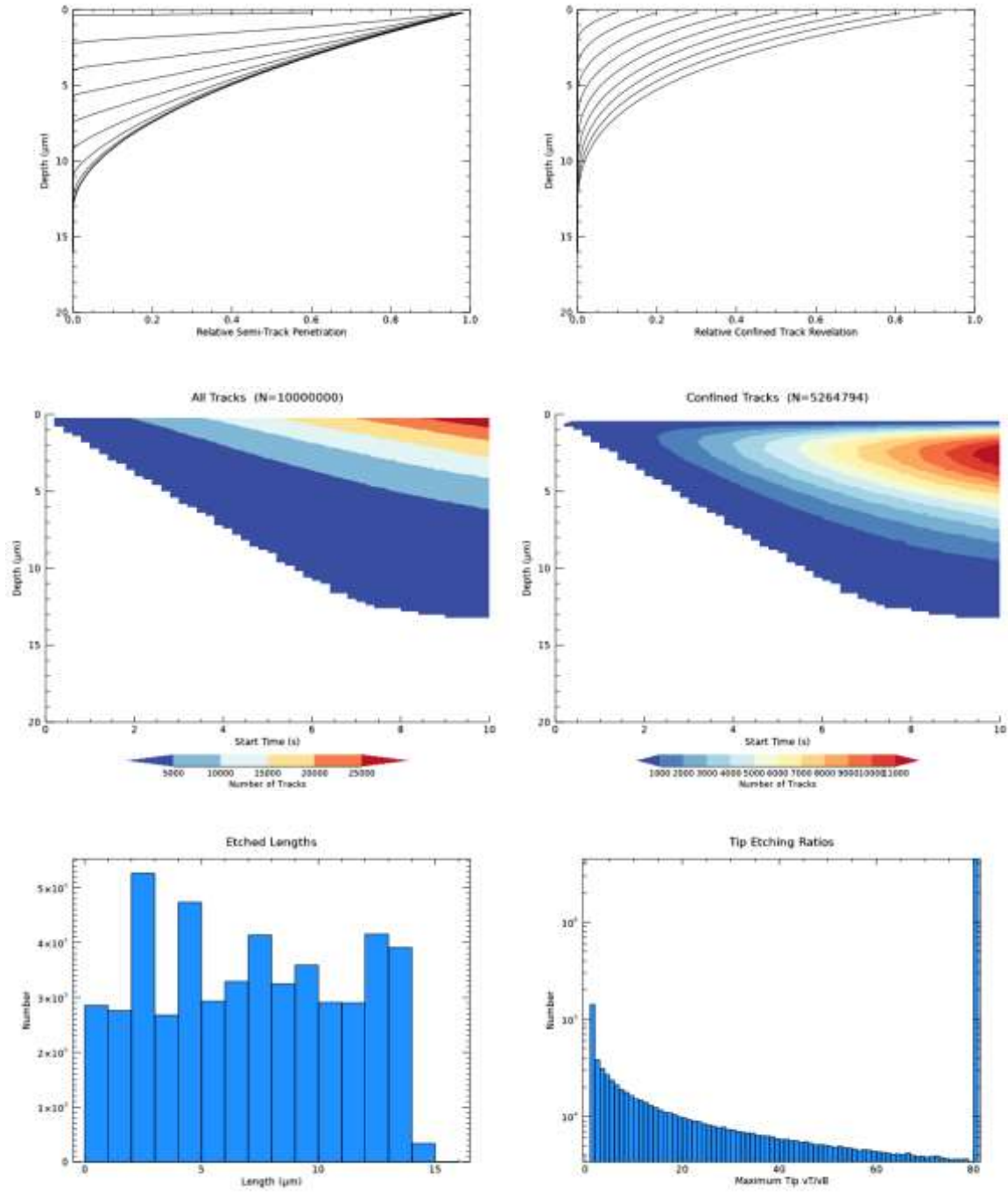


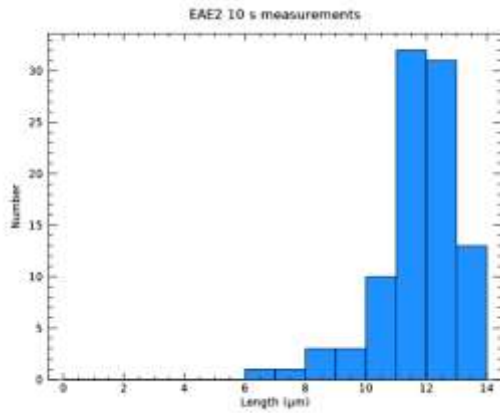
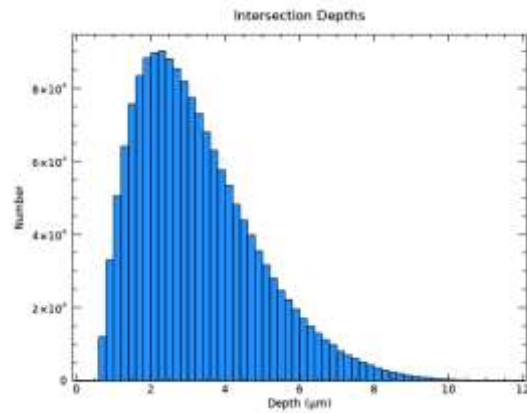
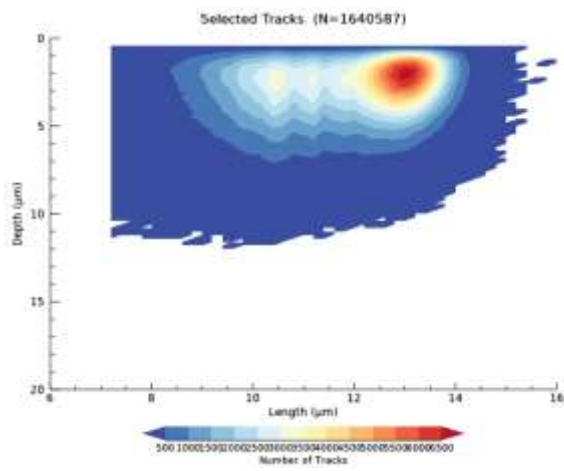
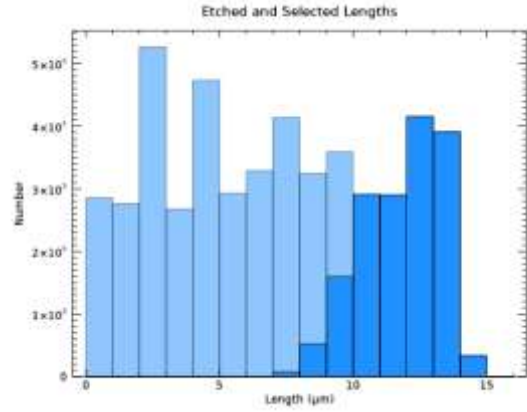
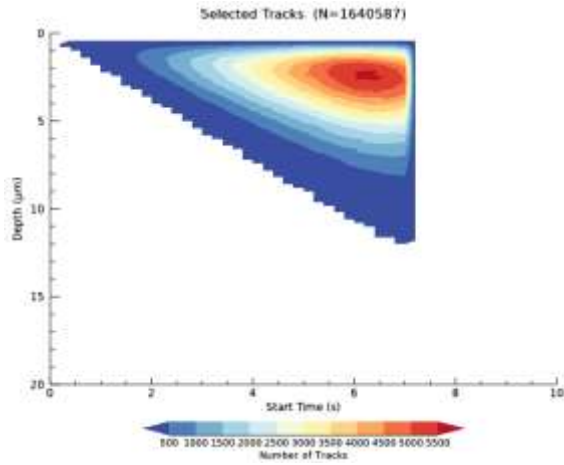
`GenerateTrackSet, 0.022, 1.767, 11.35, 1.02, /SHOW, NUM_TRACKS=1000000L,`  
`DEPTH_INC=0.2, TIME_INC=0.2, MAX_TIP_VTVB=12., MAX_DIP=25., EX_TIP=2,`  
`UNDERETCH_BIAS=3., SD_LEN=0.5, STEPS=[15,20,25,30]`

Etch step	1	12.5363	1.36998	3080992	13.3834	8.90742
3.84526						
Etch step	2	13.6181	0.499489	3080992	13.3834	8.90742
3.84526						

Etch step 3.84526	3	13.8380	0.499506	3080992	13.3834	8.90742
Etch step 3.84526	4	14.0575	0.499506	3080992	13.3834	8.90742

# EAE2 10 s model

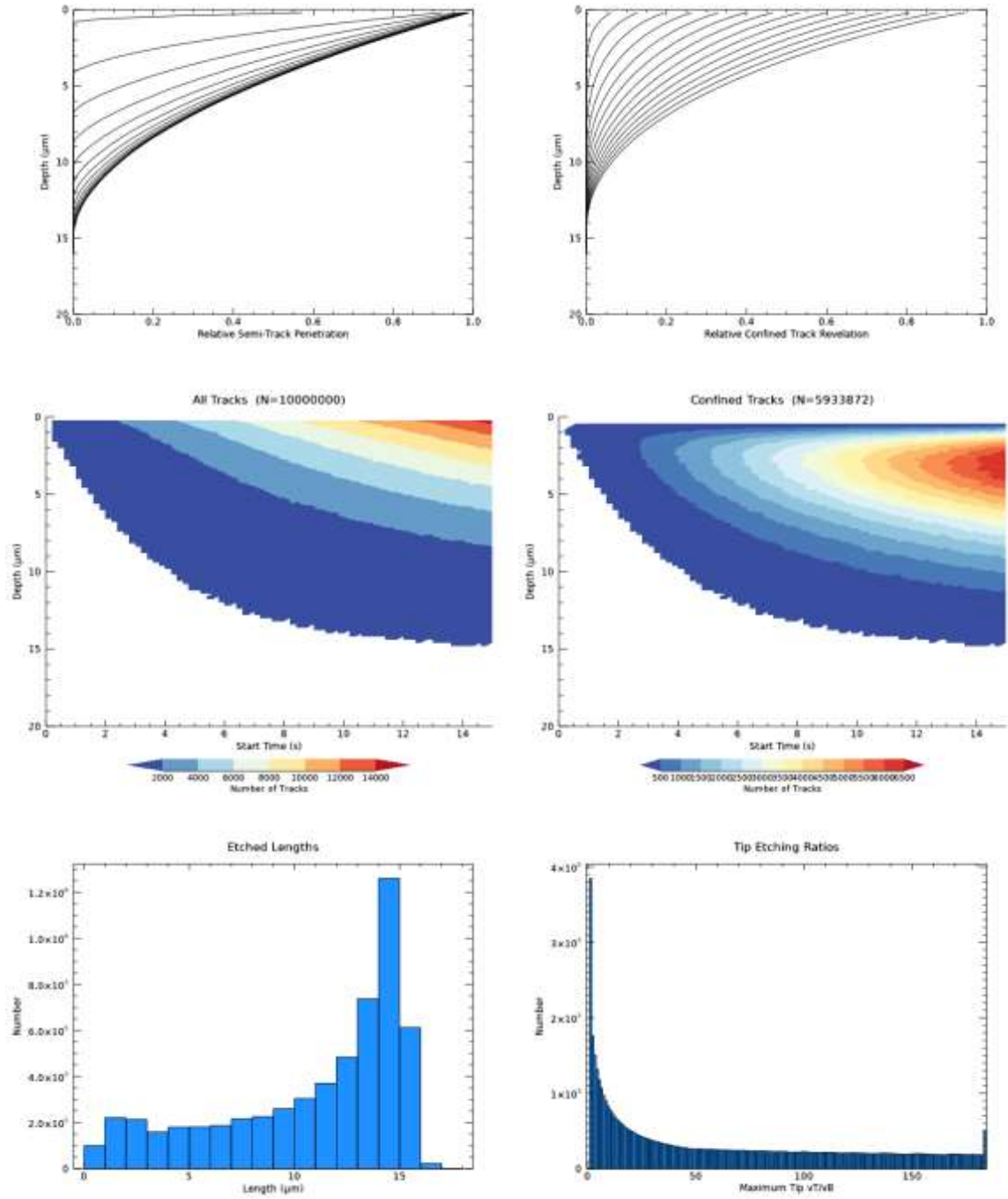


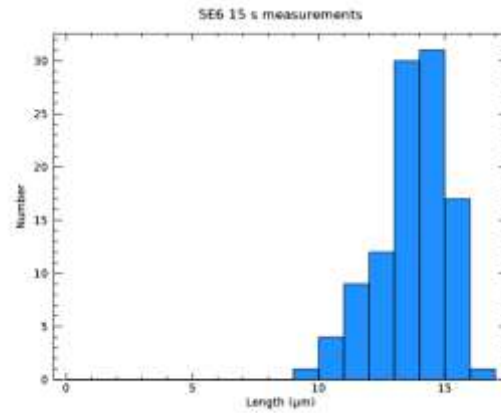
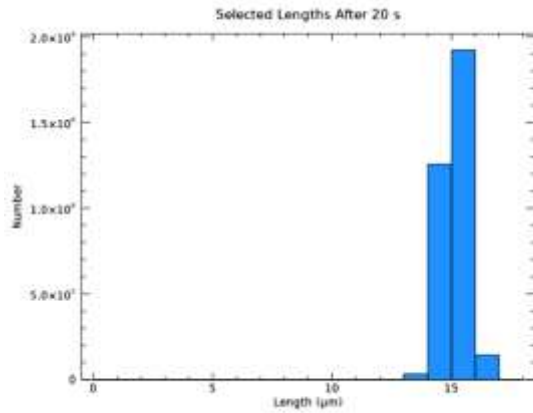
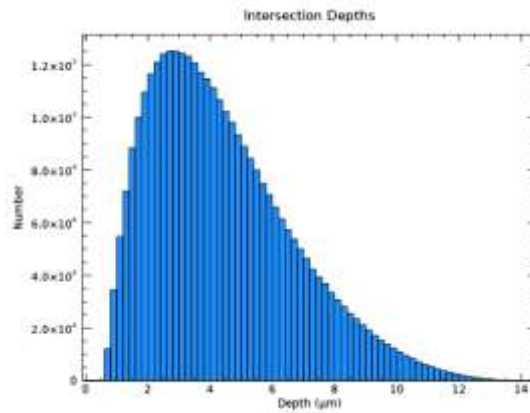
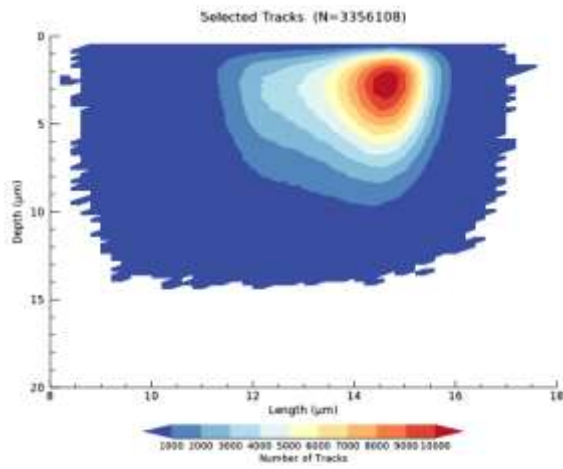
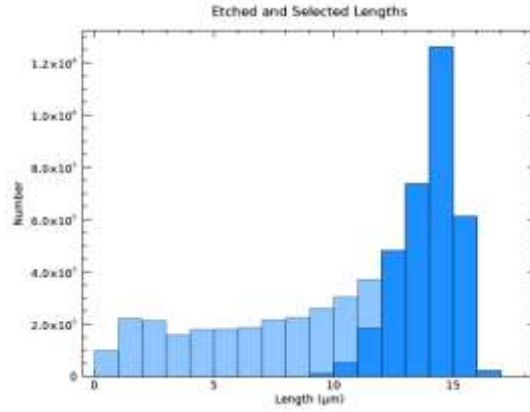
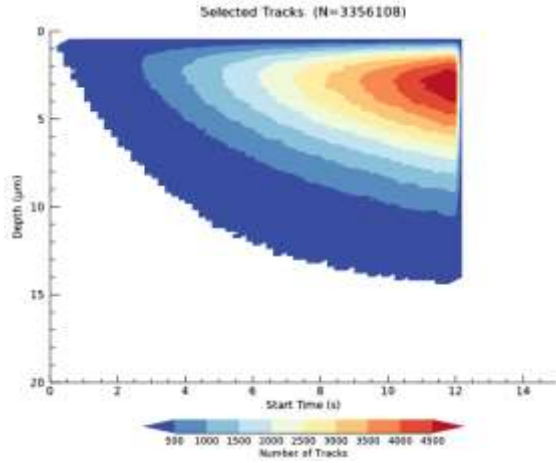


`GenerateTrackSet, 0.022, 1.767, 11.35, 1.02, /SHOW, NUM_TRACKS=1000000L, DEPTH_INC=0.2, TIME_INC=0.2, MAX_TIP_VTVB=12., MAX_DIP=25., EX_TIP=2, UNDERETCH_BIAS=3., SD_LEN=0.5, STEPS=[10]`

Etch step	1	11.8041	1.46367	1640587	13.3826	5.39837
3.14635						

# SE6 15 s model





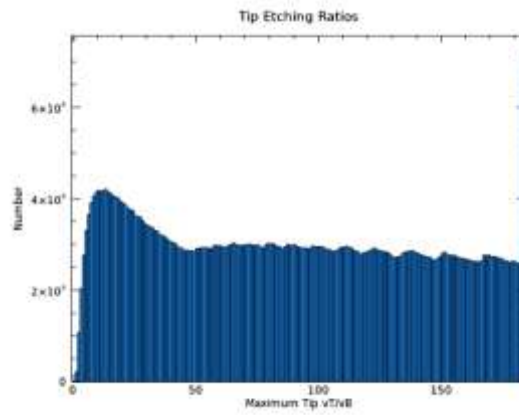
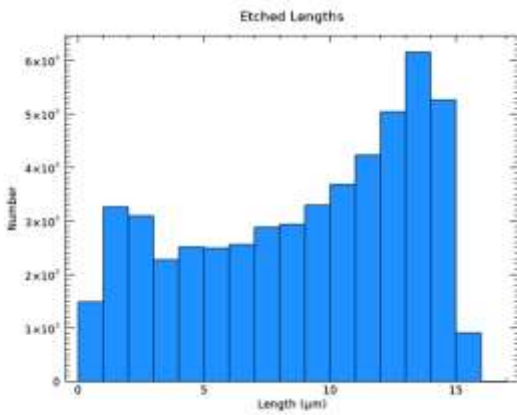
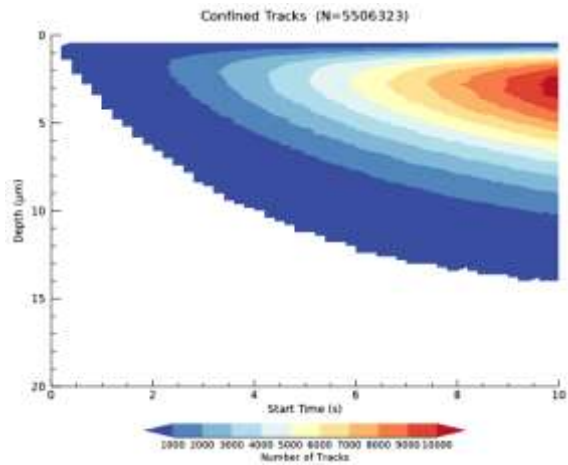
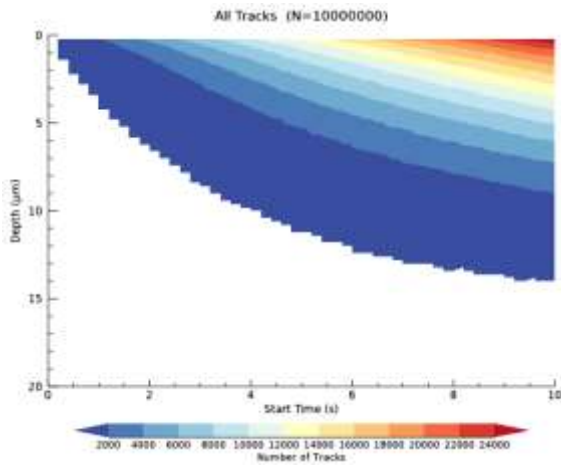
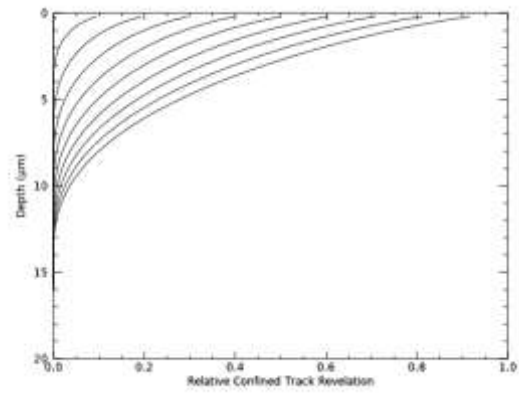
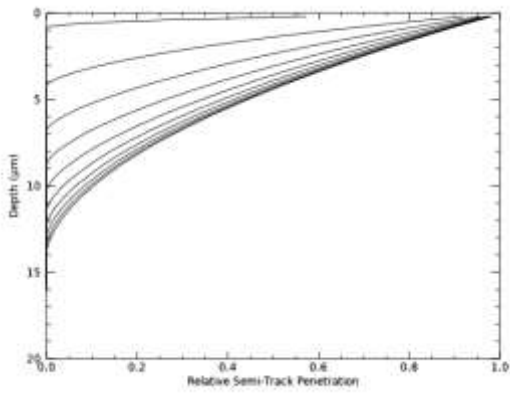
GenerateTrackSet, 0.022, 4.037, 0.19, 7.46, /SHOW, NUM\_TRACKS=1000000L,  
 DEPTH\_INC=0.2, TIME\_INC=0.2, MAX\_TIP\_VTVB=12., MAX\_DIP=25., EX\_TIP=2,  
 UNDERETCH\_BIAS=3., SD\_LEN=0.5, STEPS=[15,20,25,30]

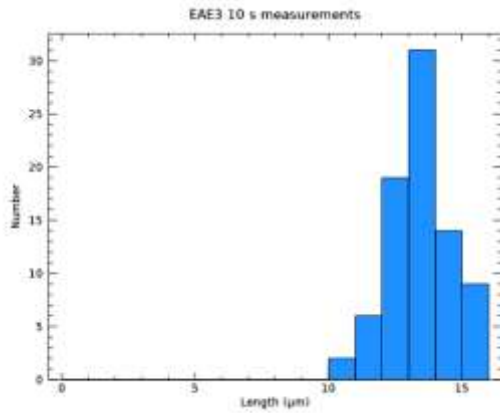
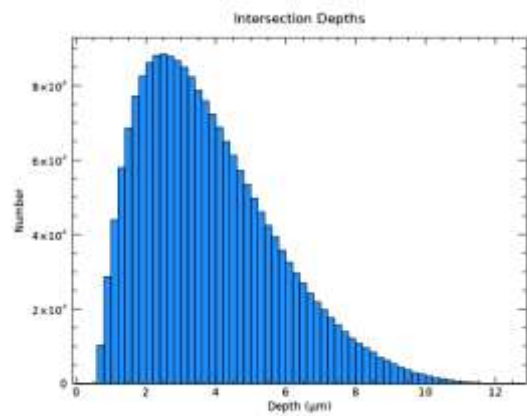
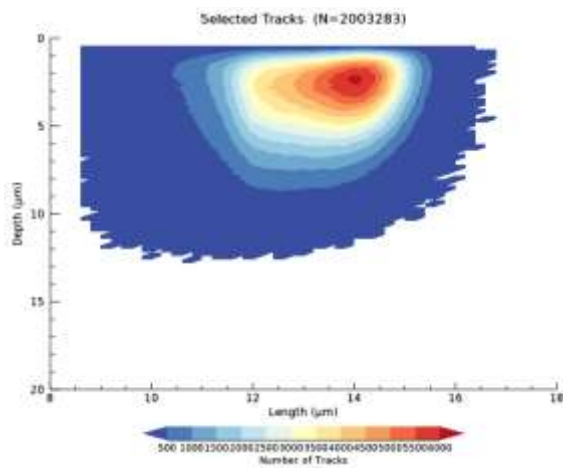
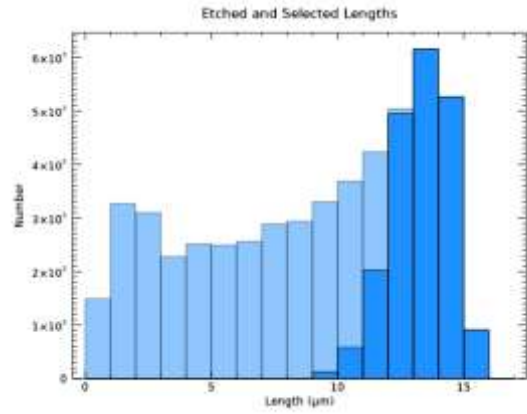
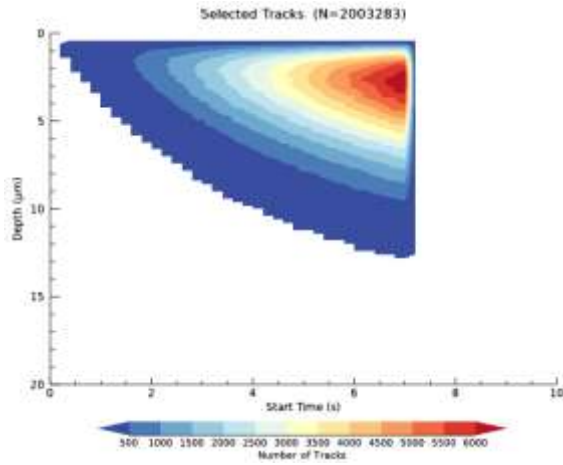
Etch step            1        13.9478        1.19814        3356108        15.1037        8.91177  
 4.29218

Etch step 4.29218	2	15.1463	0.495183	3356108	15.1037	8.91177
Etch step 4.29218	3	15.3844	0.496613	3356108	15.1037	8.91177
Etch step 4.29218	4	15.6055	0.496614	3356108	15.1037	8.91177



# EAE3 10 s model





GenerateTrackSet, 0.022, 4.037, 0.19, 7.46, /SHOW, NUM\_TRACKS=1000000L,  
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 UNDERETCH\_BIAS=3., SD\_LEN=0.5, STEPS=[10]

Etch step            1        13.2900        1.15945        2003283        15.1025        5.39186  
 3.70905