Kaon LT Status Update

October 28th, 2020

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P_{HMS} = -3.266
θ_{HMS} = 12.53

- 55 uA
  - 5149, 5150, 5152, 5154
- 45, 30, 15, 5 uA
  - 5155, 5156, 5157, 5158
- Tracking efficiency
  - (50 uA)98,97,97,97
  - 98,99,99,99

P_{SHMS} = 6.842
θ_{SHMS} = 6.495

- 55 uA
  - 5149, 5150, 5153, 5154
- 45, 30, 15, 5 uA
  - 5155, 5156, 5157, 5158
- Tracking efficiency
  - (55 uA) 95,90,93,96
  - 97,98,98,99

Cuts

- Current > 5uA
- Delta
  - HMS, (-8<delta<8)
  - SHMS, (-10<delta<20)
- xpfp
  - HMS, (-0.08<xpfp<0.08)
  - SHMS, (-0.06<xpfp<0.06)
- ypfp
  - HMS, (-0.045<ypfp<0.045)
  - SHMS, (-0.04<ypfp<0.04)
- start time
  - H(P).hod.goodstarttime == 1

Equations

$$Q_{tot} = (H.BCM.scaler.charge)$$

- Scalar

$$Y_{scaler} = \frac{N_{scaler}}{Q_{tot}} \qquad N_{scaler} = \Sigma(trigscaler)$$

- No track

$$Y_{notrack} = \frac{PS * N_{electrons}}{Q_{tot}\epsilon_{cpuLT}} \qquad N_{electrons} = \int (H/P.hod.goodscinhits)$$

$$cpuLT = \frac{EvtType}{TRIG_{accept} - edtm}$$

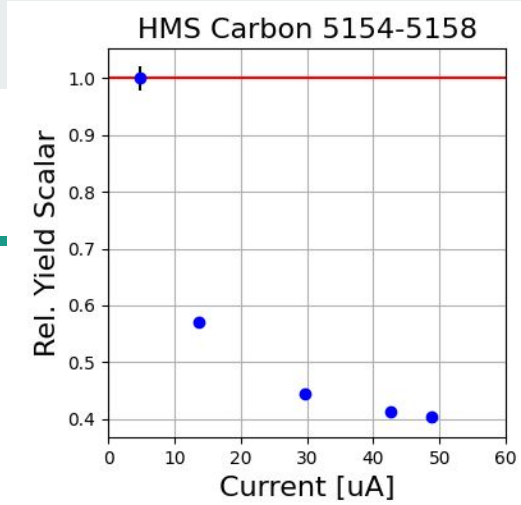
$$N_{scaler} = \Sigma(trigscaler)$$

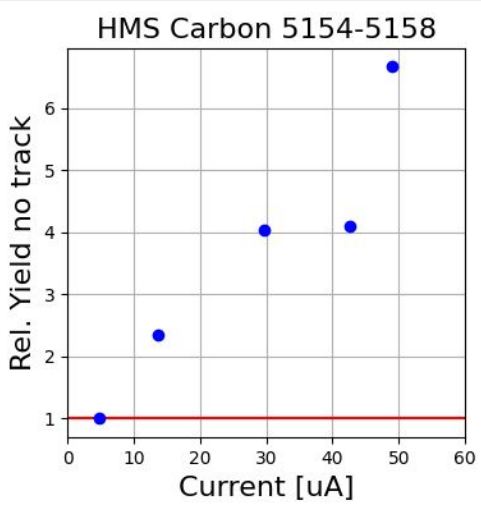
$$+= (H.hTRIG3.scaler) - (previoustrig)$$

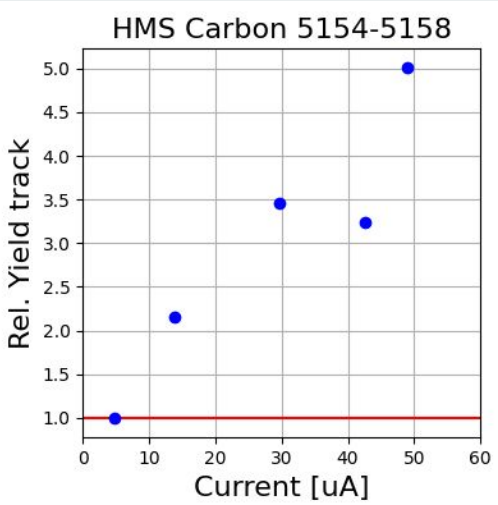
$$previoustrig = H.hTRIG3.scaler - EDTMscaler$$

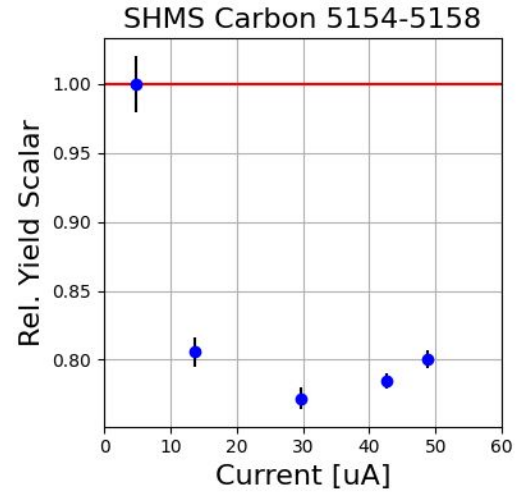
Sum is 0????

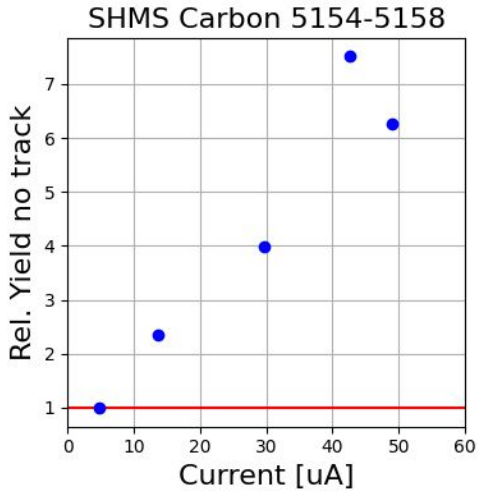
```
for ibcm in range(0, 5):
    current_I = 0
    for i, evt in enumerate(H_1Mhz_scalerTime):
        if (evt != previous_time[ibcm]):
            current_I = (
                bcm_value[ibcm][i] - previous_charge[ibcm])/(evt - previous_time[ibcm])
        if (current_I > thres_curr):
            charge_sum[ibcm] += (bcm_value[ibcm][i] -
                                 previous_charge[ibcm])
            time_sum[ibcm] += (evt - previous_time[ibcm])
        if (ibcm == 0 and (current_I > thres_curr)):
            EDTM_current = (EDTM_value - previous_EDTM)
            EDTM_sum += EDTM_current
            acctrig_sum += ((acctrig_value - EDTM_current) -
                            previous_acctrig)
            for itrig in range(0, NTRIG):
                trig_sum[itrig] += (trig_value[itrig] -
                                    previous_trig[itrig])
            for iPRE in range(0, NPRE):
                PRE_sum[iPRE] += (PRE_value[iPRE] - previous_PRE[iPRE])
                SHMS_PRE_sum[iPRE] += (SHMS_PRE_value[iPRE] -
                                       SHMS_previous_PRE[iPRE])
            for iRATE in range(0, NRATE):
                rate_sum[iRATE] += (rate_value[iRATE] -
                                    previous_rate[iRATE])
            for iRATE in range(0, SHMSNRATE):
                SHMS_rate_sum[iRATE] += (SHMS_rate_value[iRATE] -
                                         SHMS_previous_rate[iRATE])
            previous_acctrig = (acctrig_value - EDTM_current)
            previous_EDTM = EDTM_value
            for itrig in range(0, NTRIG):
                previous_trig[itrig] = trig_value[itrig]
            for iPRE in range(0, NPRE):
                previous_PRE[iPRE] = PRE_value[iPRE]
                SHMS_previous_PRE[iPRE] = SHMS_PRE_value[iPRE]
            for iRATE in range(0, NRATE):
                previous_rate[iRATE] = rate_value[iRATE]
            for iRATE in range(0, SHMSNRATE):
                SHMS_previous_rate[iRATE] = SHMS_rate_value[iRATE]
        time_total += (evt - previous_time[ibcm])
        previous_time[ibcm] = evt
        previous_charge[ibcm] = bcm_value[ibcm][i]
```

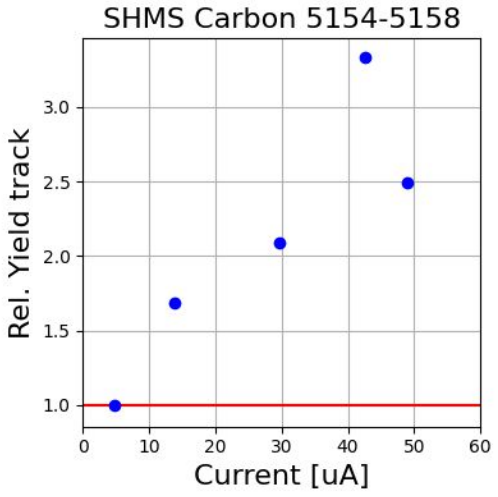

HMS Carbon 5154-5158
Rel. Yield Scalar
Current [uA]

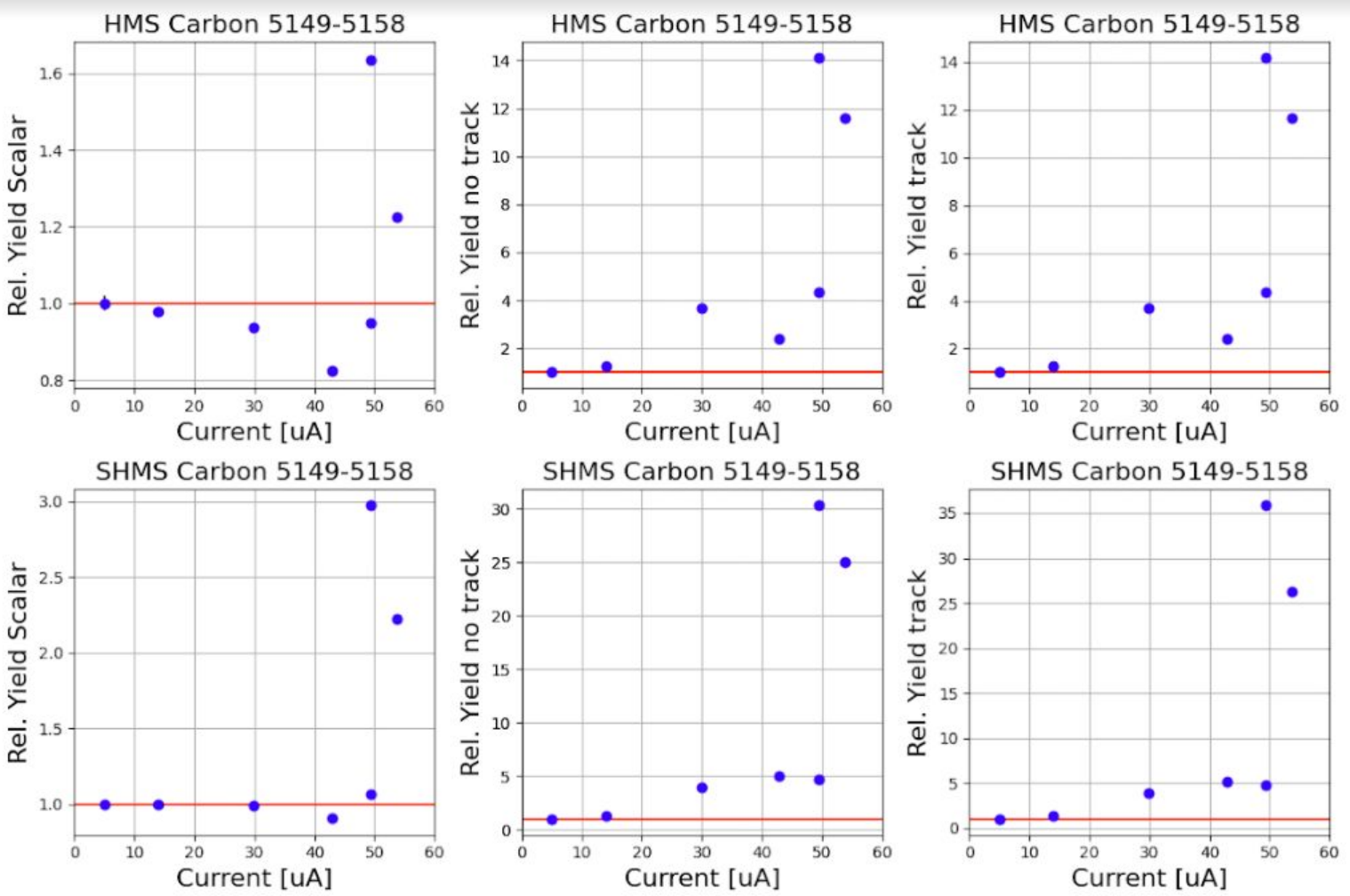

HMS Carbon 5154-5158
Rel. Yield no track
Current [uA]


HMS Carbon 5154-5158
Rel. Yield track
Current [uA]

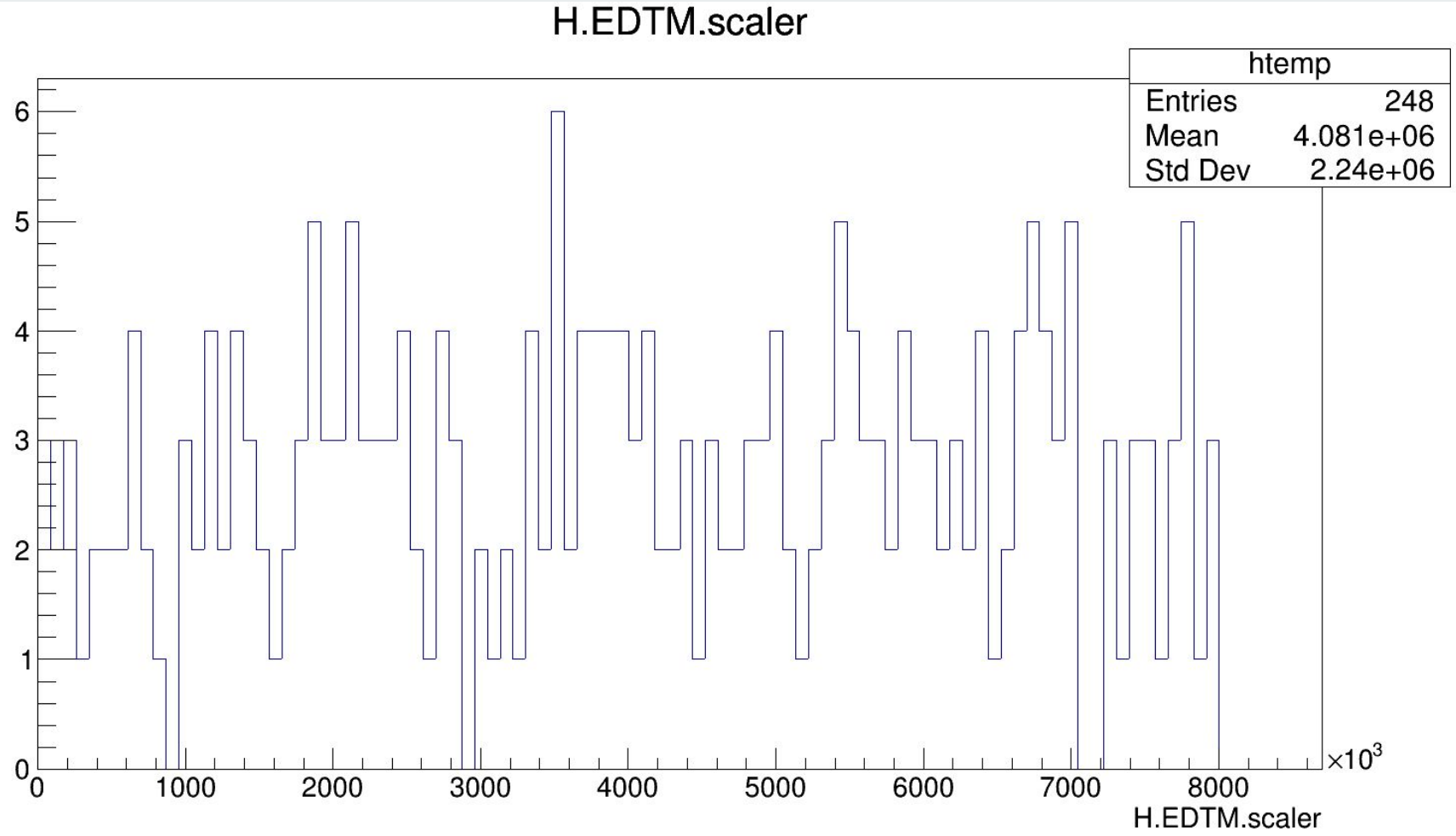

SHMS Carbon 5154-5158
Rel. Yield Scalar
Current [uA]


SHMS Carbon 5154-5158
Rel. Yield no track
Current [uA]


SHMS Carbon 5154-5158
Rel. Yield track
Current [uA]


HMS Carbon 5149-5158
Rel. Yield Scalar
Current [uA]
HMS Carbon 5149-5158
Rel. Yield no track
Current [uA]
HMS Carbon 5149-5158
Rel. Yield track
Current [uA]
SHMS Carbon 5149-5158
Rel. Yield Scalar
Current [uA]
SHMS Carbon 5149-5158
Rel. Yield no track
Current [uA]
SHMS Carbon 5149-5158
Rel. Yield track
Current [uA]

Extra


H.EDTM.scaler
htemp
Entries 248
Mean 4.081e+06
Std Dev 2.24e+06
0
1
2
3
4
5
6
0
1000
2000
3000
4000
5000
6000
7000
8000
×10^3
H.EDTM.scaler

Track cuts

- Hodo good scin hit
  - HMS, (goodscin=1)
  - SHMS, (goodscin=1)
- Hodo beta no track
  - HMS, (0.8<beta<1.3)
  - SHMS, (0.5<beta<1.4)
- Plane hit
  - HMS, (dc1<20,dc2<20)
  - SHMS, (dc1<20,dc2<20)
- ntrack
  - HMS, (ntrack>1)
  - SHMS, (ntrack>1)