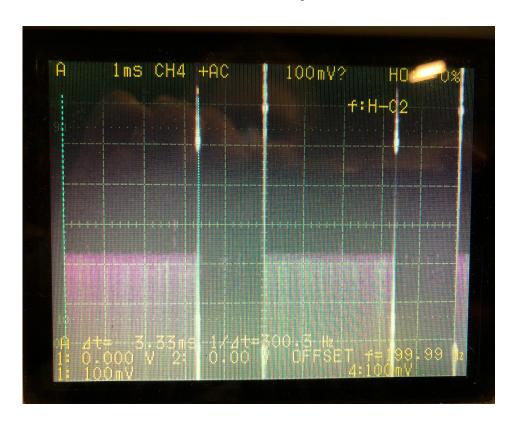


- Dec 7/20: transferred frozen-spin target eHD66: Oxford dilution fridge \rightarrow Production Dewar for NMR { P(H) = 32 % } \rightarrow IBC
- Dec 8/20: AFP to flip sub-state population: −32% → +32 %; cave-2 roof reinstalled
- Dec 9/20 Run 3 resumed
 - study dP(H)/dt with beam blanking to provide regular intervals for charge to dissipate.
- Standard *USER-MODE* utility allows
 1 gap within a 5 ms interval
 - tested 3.333 ms ON + 1.667 ms OFF (d.f. = 2/3)
 - tested 1.667 ms ON + 3.333 ms OFF (d.f. = 1/3)



run IBC as cold as possible, T = 70 – 80 mK



fixed peak current Ipeak = 250 pA :

fixed average current <le = 125 pA> :

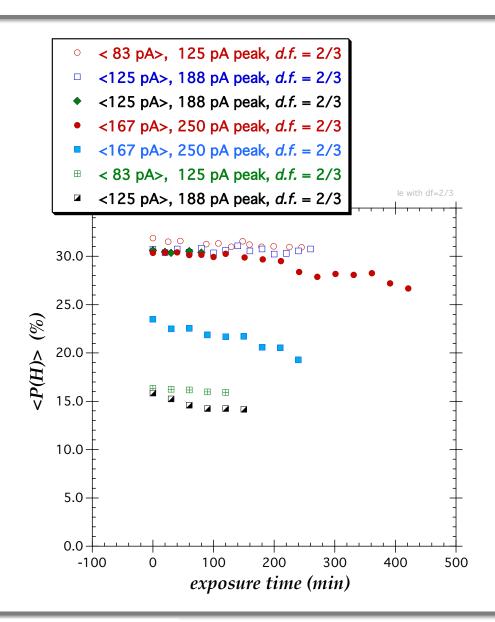
<167 pA>, 250 pA peak, d.f. = 2/3<125 pA>, 188 pA peak, d.f. = 2/3<83 pA>, 250 pA peak, d.f. = 1/3<125 pA>, 188 pA peak, d.f. = 2/3<125 pA>, 125 pA peak, d.f. = 1 <167 pA>, 250 pA peak, d.f. = 2/3le<125> vs df <250 pA>, 250 pA peak, *d.f.* = 1 <125 pA>, 188 pA peak, d.f. = 2/330.0 30.0 25.0 25.0-(%) (%) <P(H)><*P*(*H*)> 20.0 20.0 15.0 15.0-10.0-10.0 5.0-5.0-0.0 -0.0 --100 100 200 300 400 500 -50 50 100 150 200 250 300 0 0 *exposure time (min)* exposure time (min)



P(H) at fixed d.f. = 2/3 :

Status:

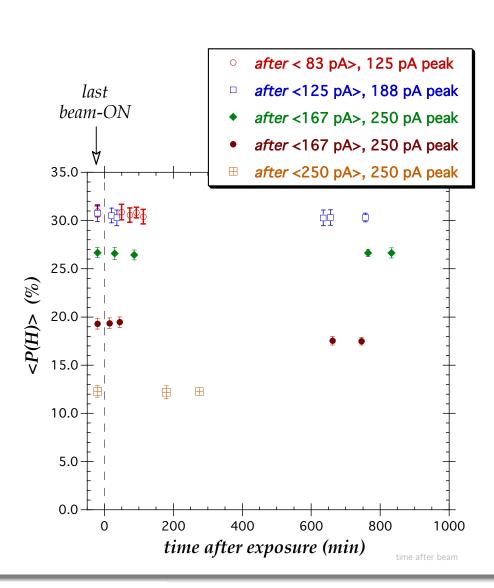
- at 1/8 nA, dP/dt ~ very small
- but at higher currents,
 P(H) begins to drop
- no improvement with standard coarse beam-blanking





• P(H) after exposure stops:

- no evidence for permanent radiation damage
- polarization loss is generated by a transient condition when beam electrons are present; time constant is smaller than 3.3 ms





outlook for the last week:

- study exposure with new USER-MODE utility that could blank the beam for 0.33 ms periods ~ factor of 10 smaller than previous tests (hopefully never used before)
- test dP/dt under different holding fields \Leftrightarrow dependence on atomic electron polarization
- test dP/dt dependence on current
- Run 3 ends Dec 17th
- Dec 18: last day to remove the cave-2 roof
- Dec 18: extract the target
- Dec 19 21: bring cryostats to a safe state for the shutdown