Putting Beam on the Golden Orbit

Preconditions:

1. We are operating in HDIce-safe CW mode, with fiber amplifier current set to ~ 350 mA. With this fiber amplifier setting, any viewer can be inserted in CW mode, YAG or chromox, we won’t hurt these viewers with ~ 100 pA beam. We don’t even hurt them at a few nAs, but the image will likely be too bright.
2. with settings from reasonable allsave, there is beam on viewers ITVM904, ITVM905 and ITVMA01A/B using attenuator setting ~ 140
3. apertures 5 and 6 retracted from nominal ~ 670 position (corresponds to 67 mm insertion depth)

Beam tuning

1. Note: conventional “machine safe” modes like Viewer Limited and Tune Mode, are not HDIce target safe. The uA-level current during the beam ON portion of the macropulse can vaporize the frozen HD target. At UITF, for HDIce tests, we operate in CW mode, which seems counterintuitive, but atypical laser amplifier settings prevent us from sending more than some tens of nA to the target, average current is always small.
2. Insert Faraday Cup4, used to measure current but it also protects HDIce
3. Set attenuator to 140 and verify dump current of the order ~ 100 pA, which is sufficient to light up a viewer
4. Insert ITVM904 and steer beam to designated location using MHBM904 H&V
5. Remove viewer and set attenuator to 200, record FCup4 current on the order of 400 pA
6. Insert A5 and optimize transmission using StepNGraph. Typically, optimal insertion depth is 670
7. Steer with MHBM904H to minimize beam loss on aperture 5, maximize the current reading at FCup4
8. Set atten to 140, viewer safe
9. Insert viewer ITVM905 and steer to designated location using MHBM904A H&V
10. Remove viewer and increase current at FCup4 to ~ 400 pA
11. Insert A6 and optimize the insertion depth using StepNGraph
12. Set attenuator to 140 viewer safe and ask Team HDIce if you can send beam to HDIce dump
13. Pull FCup4 and insert ITVMA01A or B, steer beam to designated location using MCRM904C H&V
14. Pull viewer ITVM905 and insert FCup4, set CW current to what HDIce asks for, pull the cup and let them make measurements