**New 90Prime Camera Installation**

Prerequisites:

1. 90Prime ring is installed on telescope
2. Bottom cover plate and proper bottom weights are installed
3. Upper wind screen is stowed
4. Small crane is moved to opposite side of dome (near wind screens)
5. New 90Prime dewar has been on vacuum pump for at least 48 hours and pressure on its gauge readout is < 1e-04 Torr
6. Both 90Prime power switches in control room computer rack are OFF
7. If old 90Prime is being removed, turn off temperature controller and shutter power on web interface

Remove camera dewar from vacuum pump and fill with LN2:

1. Close valve on camera dewar
2. Close hi-vac valve on pump cart
3. Open up-to-air valve on pump cart
4. Detach vacuum hose from camera dewar
5. Detach cable from camera dewar pressure gauge readout
6. Install blank-off on camera dewar valve
7. Check that bolts mounting camera dewar to stand are secure
8. Roll camera dewar stand out of pump room and position near 160 liter LN2 storage dewar
9. Tilt camera dewar on stand to an angle between 45 and 60 degrees
10. Install new 90Prime LN2 fill device to LN2 supply line coming from 160 liter storage dewar
11. Insert LN2 fill device into fill port on camera dewar and secure by engaging a few threads on nut (it’s not necessary to tighten completely)
12. Turn on LN2 supply and fill camera dewar until LN2 can be seen coming out of the vent port on fill device
13. Detach fill device from camera dewar (but leave it attached to LN2 supply line).

Prepare crane and 90Prime ring for camera dewar mounting

1. Enable “limit override” in TCS and move telescope to EL=20, AZ=180
2. Install limit override paddle (plug into connector on bottom of telescope)
3. Move telescope to EL=12.5, AZ=180
4. On upper platform, remove blue flat field lamps to give more room to move around
5. Lower large crane and attach yellow clamp to center of spreader bar
6. Attach orange chain hoist to clamp
7. If old 90Prime is on the telescope, remove it according to normal procedure, lower it onto its stand and secure with bolts. If counter-weight plate is on, remove it with crane/chain hoist and lower it to rest to the right of the tool board.
8. Install guide pins at locations shown in IMG\_0648.
9. Place shims through guide pins

Lift camera dewar from observing floor and attach to telescope

1. Bring camera dewar back to vertical and attach lifting fixture “horseshoe” (see IMG\_0636)
2. Install center pin into dewar neck opening and attach to horseshoe (see IMG\_0633)
3. Rotate dome so crane is above camera dewar
4. Lower crane, attach chain hoist hook to horseshoe and take up slack on chain
5. Remove bolts from new 90Prime stand
6. Use chain hoist to start lifting camera dewar from stand (see IMG\_0635), taking great care to protect air hose fitting on bottom of dewar as it passes through the stand (best to have two people, one to raise dewar, another to watch air hose fitting)
7. Once camera dewar is clear of the stand use crane to lift it to telescope height
8. Rotate dome back to 90Prime camera dewar install position
9. Install cleat for angle arm on dewar
10. While camera dewar is being held steady by a second person, remove center pin, tilt dewar (with e-box facing upwards) and install angle arm (note: this is a work in progress, the current angle arm doesn’t position the dewar correctly so for now we don’t use it). See IMG\_0642. NOTE: be careful of LN2 spilling from dewar when it is tilted!
11. Remove window cover and use N2 gas to blow off any dust on window
12. Use crane and chain hoist to bring dewar to the guide pins and carefully move dewar so it rests against end of telescope being careful to avoid any LN2 spill from dewar (see IMG\_0647)
13. Use 1.5” long bolts with washers to secure dewar to telescope (use chain hoist to slightly lower or raise dewar if bolts resist threading into holes)
14. Once all but two bolts have been installed, remove guide pins and install remaining two bolts
15. Perform final tightening of all bolts
16. Remove angle arm cleat from dewar
17. Attach new 90Prime cabling from ring to e-box (power, network)
18. Turn on power switch on e-box
19. Set weight stack values for new 90Prime on console
20. Stow cranes
21. Move telescope to EL=20, AZ=180 and remove limit override paddle
22. If power cables and fibers for ring are not already plugged in, move telescope to EL=20, AZ=360 and plug them in
23. Turn on two 90Prime power switches on control room computer rack
24. Move telescope to EL=15, AZ=180 and install filters