

Standard Operating Procedure

for unmounting the ADFOSC

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Scope

This document provides the standard operating procedure to unmount the ARIES-Devasthal Faint Object Spectrograph (ADFOSC) from the 3.6m Devasthal Optical Telescope.

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1 Procedure

These are the steps to be followed while unmounting ADFOSC from the axial port of the 3.6m Devasthal Optical Telescope.

1. After the last observation, switch off the compressor and leach controller before the scheduled date of unmounting.
2. Park the telescope before starting the unmounting procedure.
3. Lock the altitude mechanical locks before proceeding forward for the unmounting procedure.
4. If any filter needs to be changed before unmounting it, then home the filter wheel before opening the cover of the filter compartment. Similarly, home it before closing the cover.
5. The unmounting procedure starts with untying the wires connected to the ADFOSC. This process should be performed with extra care so no cables are damaged.
6. Check the CCD temperature, it should be at room temperature (above 5 °C) as shown in Fig. 1.
7. Now, switch off the Lakeshore controller (CCD temperature controller) and turn off the ADFOSC power from the side plug points as shown in Fig.2.
8. Remove the CCD connections (leach, lakeshore, shutter, and vacuum gauge connections). Now CCD is free to unmount. **Do not forget to wear an antistatic wristband during this step.**
9. There are two read-out ports, 1 connected to the temperature controller, 1 for the vacuum, and 1 for shutter control. Remove the wires from all these ports and then cover them with tissue paper as shown in Fig. 3.
10. Now first disconnect the coolant supply pipe and then the return pipe from the CCD as shown in the top panel of Fig. 4 (**this should always be the sequence**). Now, cover these ports of the CCD with aluminium foil and tissue paper as shown in the bottom panel of Fig. 4. Clean the compressor with the help of a vacuum cleaner.
11. Put the azimuth coverplate below the telescope.
12. Now disconnect the coolant supply and return wires from the compressor as shown in the top panel of Fig. 5. After this, close the wire ports with their caps as shown in the bottom panel of Fig. 5.
13. After removing all the wires from the CCD put the jack below the CCD to have a secure unmounting as shown in the Fig. 6. Put a foam on the jack before landing the CCD on it.
14. Unmount the CCD from the ADFOSC as shown in the top panel of Fig. 7. The unscrewed port is shown in the bottom panel of this figure. **Handle the CCD with care during the process.**
15. Now slowly reduce the height of the jack. This process should be done with extra care, as it will give jerks if mishandled.

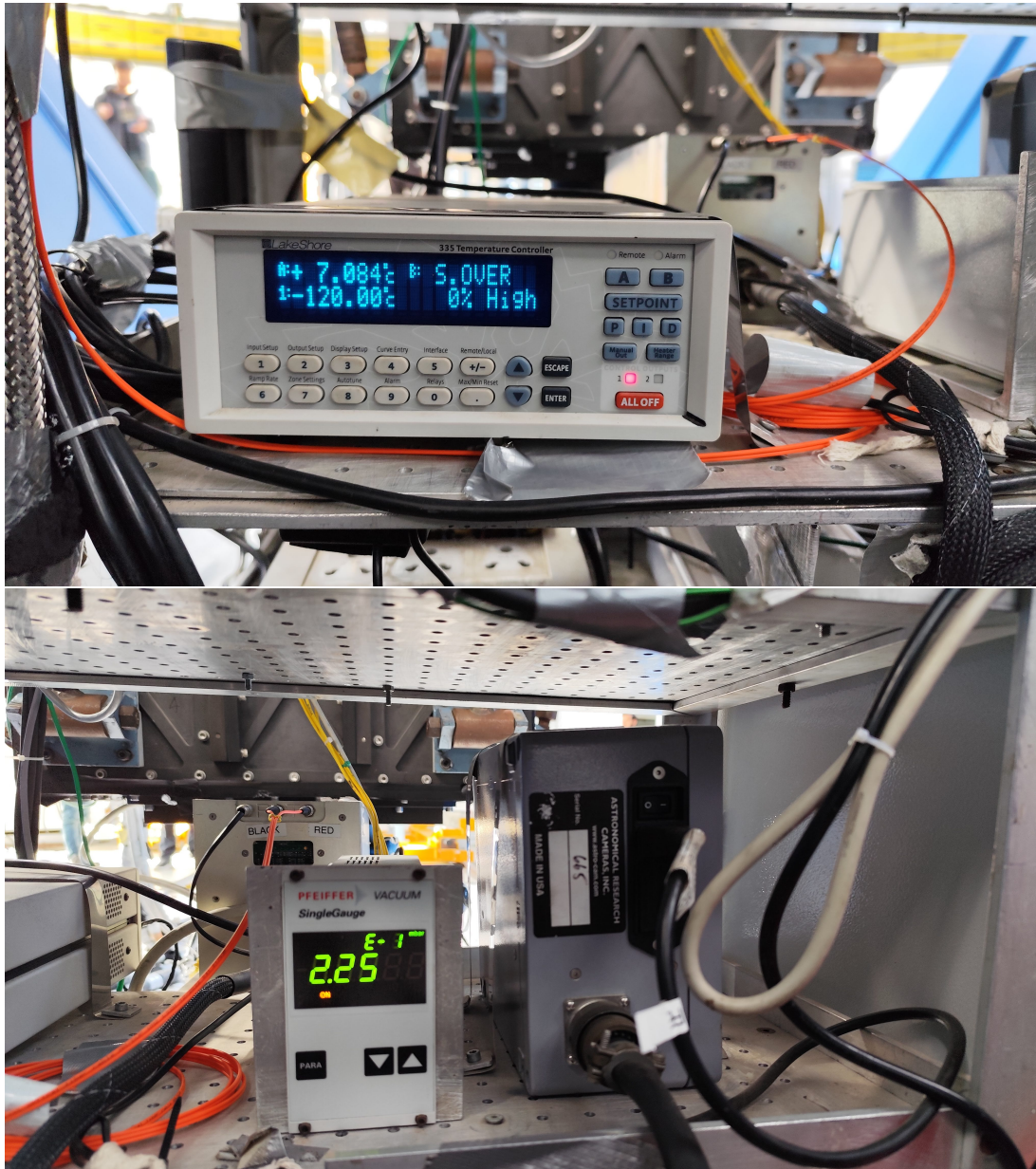


Figure 1: The temperature and pressure of the CCD can be checked from here.

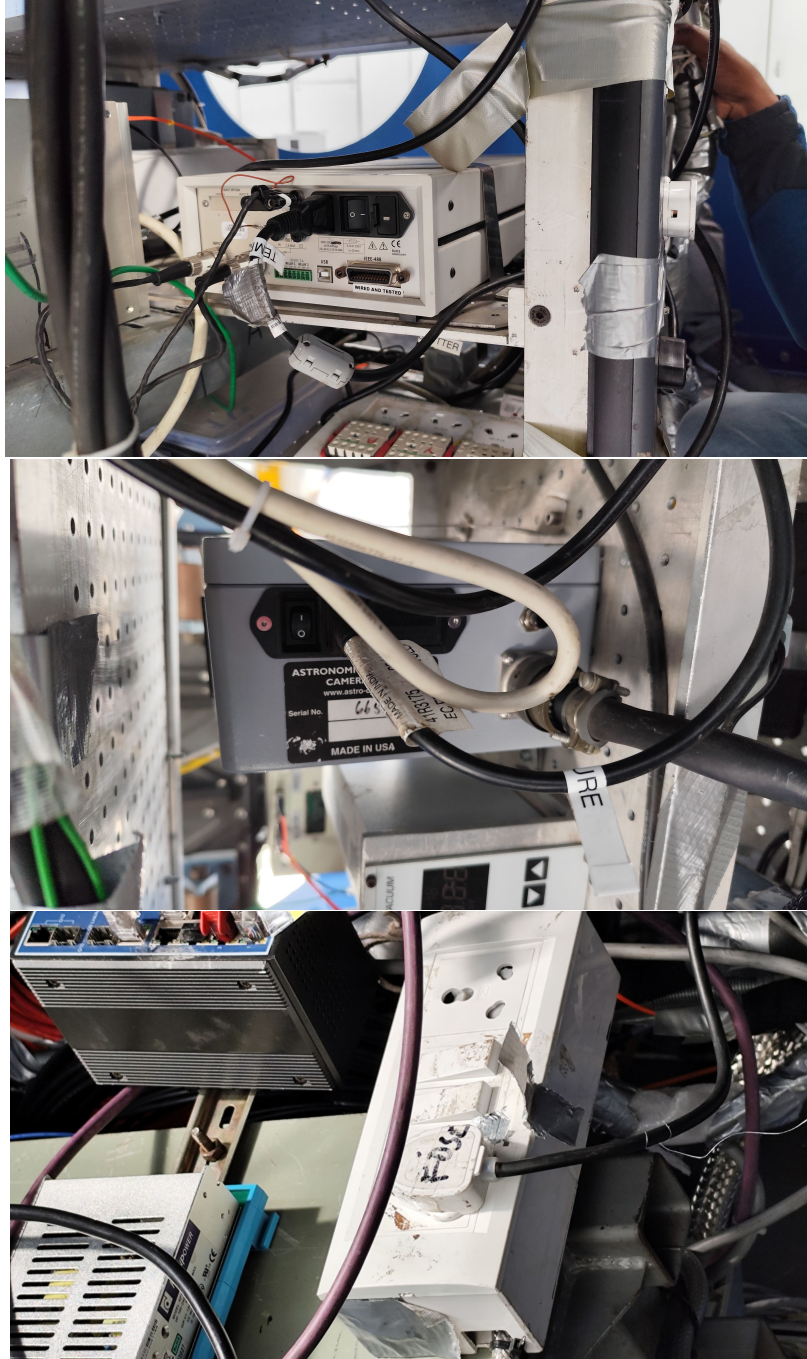


Figure 2: Top to bottom: CCD temperature controller, pressure controller, ADFOSC main switch.

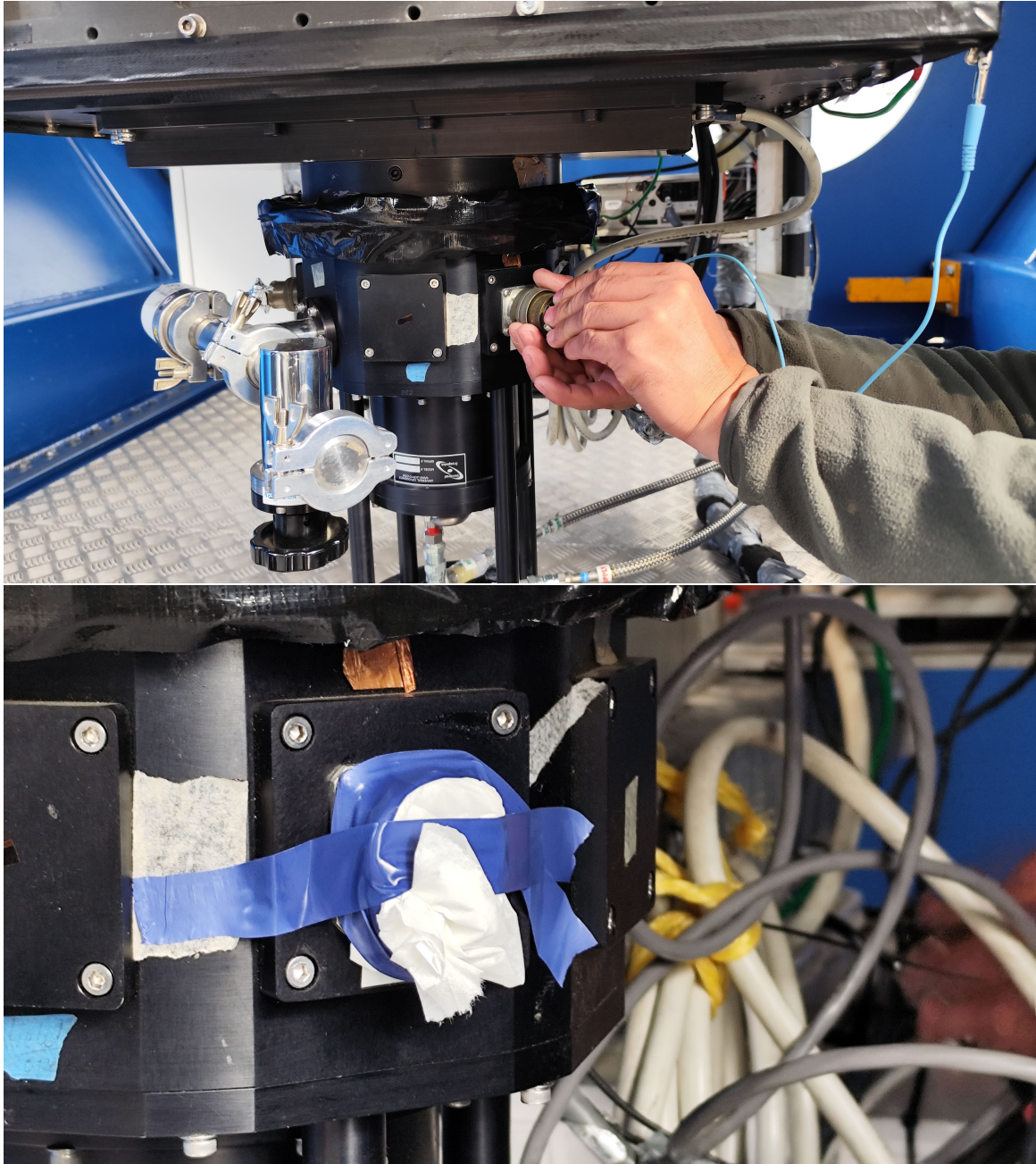


Figure 3: Top to bottom: Removing the wires connected to the CCD. Cover the ports with tissue paper.



Figure 4: Top to bottom: Removing the coolant supply and return wires connected to the CCD. The ports should be covered with aluminum foil as shown in the figure.



Figure 5: Top to bottom: The compressor supply and return ports after removing the cables. Same ports after putting on the caps.

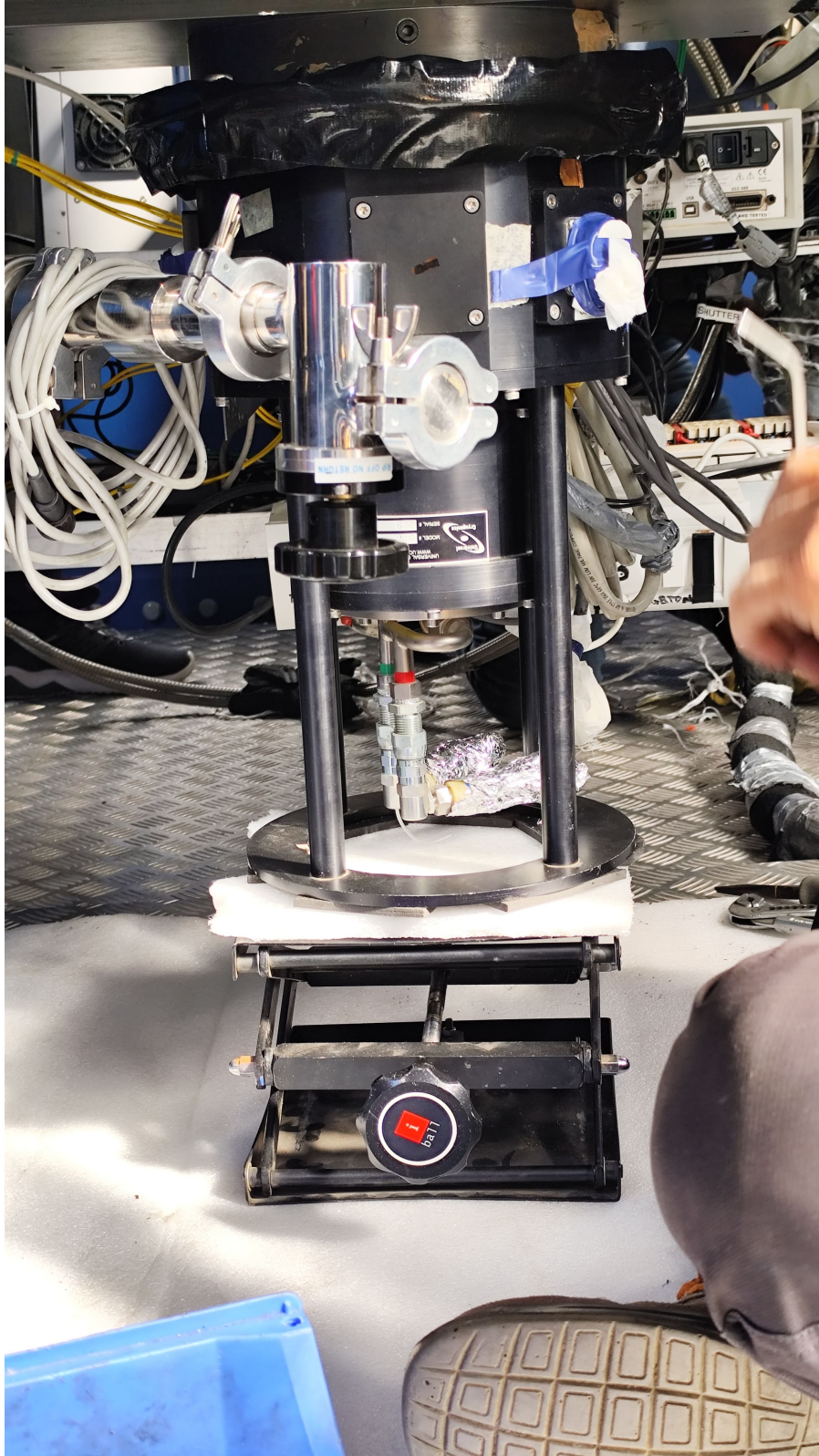


Figure 6: Place the jack below the CCD as shown here.

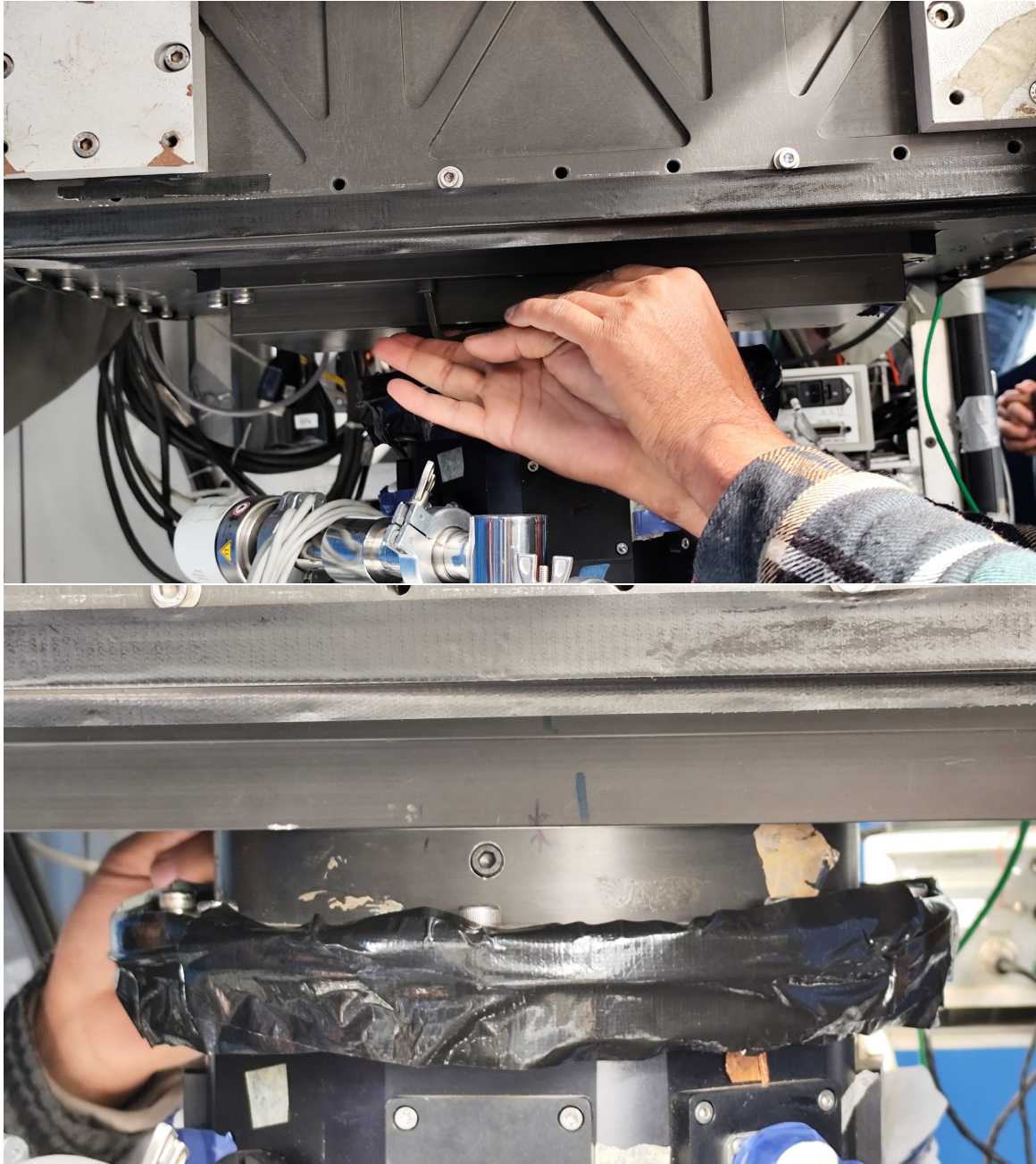


Figure 7: Top to bottom: Unmount the CCD from the ADFOSC by unscrewing it from the joint as shown here. The unscrewed port is shown in the bottom panel.

16. Cover the top of the CCD and secure it with tapes as shown in the top panel of Fig. 8. Now safely put it in the CCD storage box. **The direction of the CCD in the box should be always the same as shown in the Fig. 8.**
17. Remount all the CCD screws to ADFOSC bottom flange to avoid misplacement and cover the CCD port on ADFOSC with paper as shown in Fig. 9.
18. Put the three screws back to the bottom of the compressor as shown in Fig. 10. Put the compressor back in the carton box with the power cord. Secure the gas pipes in their respective boxes.
19. Store the CCD storage box and compressor box in the adjoining room to the telescope floor with safety.
20. Remove all electrical wires connected to the instrument and secure them on the instrument for the next mounting.
21. Now disconnect the filter motor and secure these wires to the instrument for the next mounting.
22. Now disconnect the connection to the calibration unit and safely secure the instrument's wires.
23. Now remove the grounding connections as shown in Fig. 11.
24. Remove all optical fibers and Ethernet cables connected to all three port instruments as shown in Fig. 12. This is necessary to avoid any disturbance caused to the connections of other port instruments during the unmounting and mounting procedure.
25. Place the hydraulic jack below the dummy and unscrew one arm of the dummy. Remove it safely with the help of the hydraulic jack from the dummy.
26. Now, remove the instrument table mounted with ADFOSC.
27. Now remove the four ADFOSC flexure rods in the ADFOSC and secure their screws with them as shown in Fig. 13.
28. Make ready the crane and transfer the trolley with the unmounting assembly for unmounting the instrument.
29. Remove the beam of the unmounting tool. Move the transfer trolley below the telescope and instrument as shown in Fig. 14. **During this step, carefully observe the gap between ADFOSC and the unmounting tool.**
30. Mount the stands of ADFOSC on two sides (which are used while mounting and unmounting the instruments) and secure them with screws as shown in Fig. 15 and put the clamps on both sides.
31. Now mount back the beam of the unmounting tool.
32. Move the jack upwards and ensure it is well attached to the instrument. While doing this take care of the wires of the calibration unit. There are four sides from which the jack can be moved upwards. Make sure the jack moves evenly from each side so that it touches the instrument equally from each side.

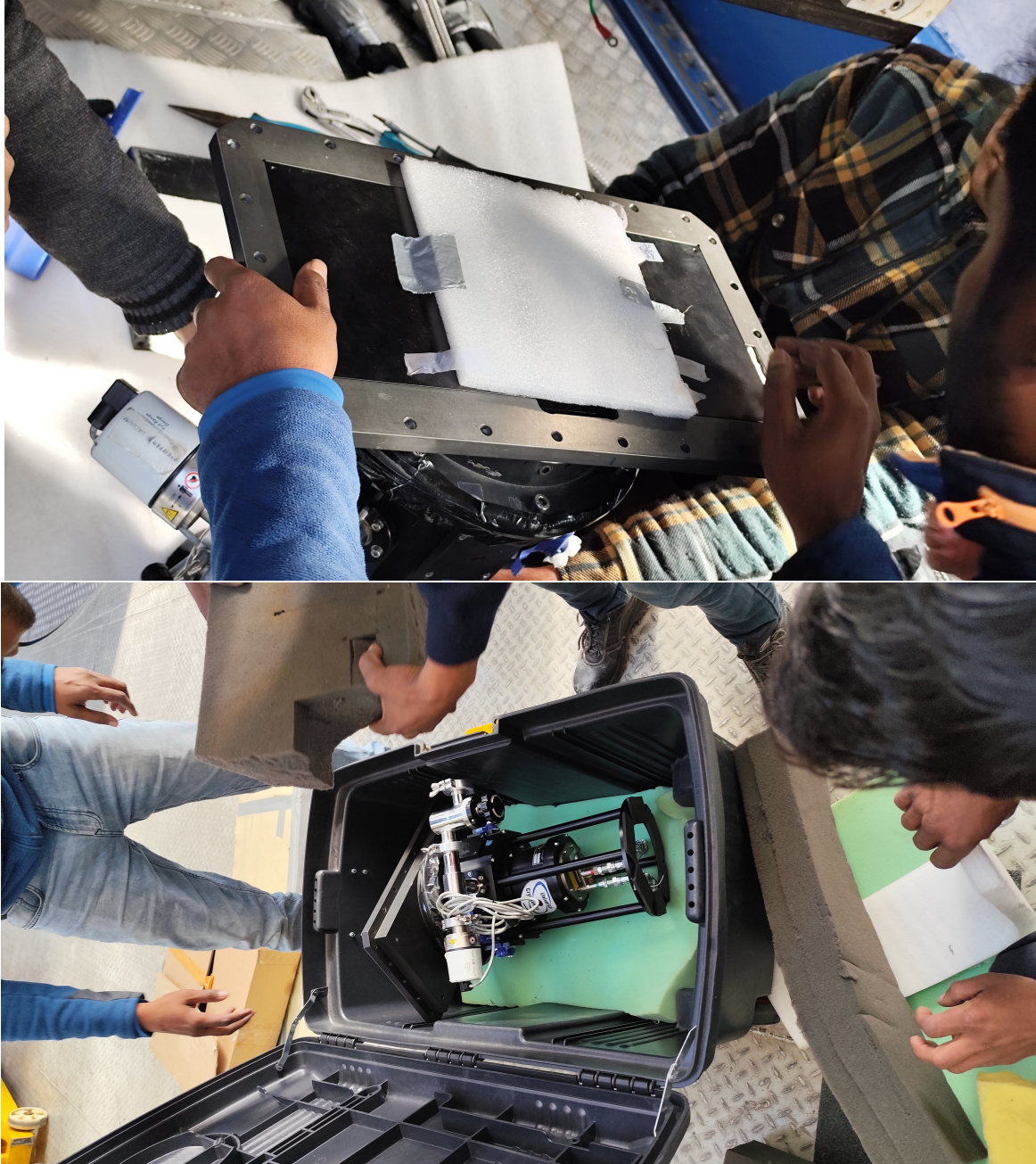


Figure 8: Top to bottom: Cover the CCD and secure the cover with tapes. Store the CCD in the storage box.

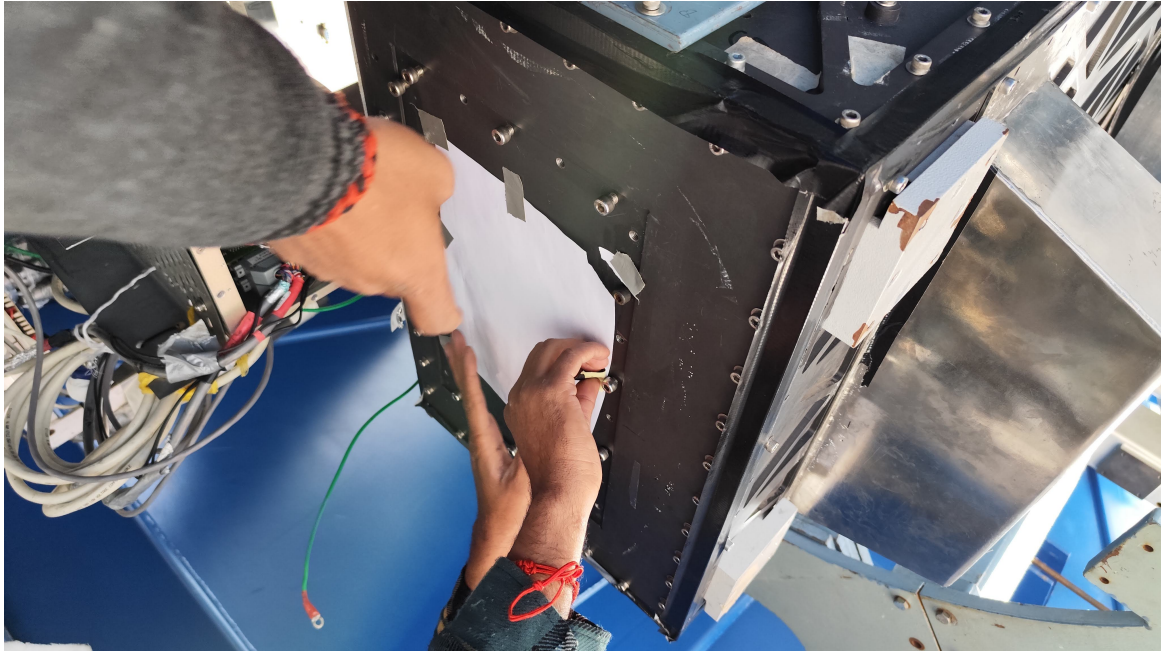


Figure 9: Cover the CCD port on ADFOSC.



Figure 10: The screws at the bottom of the compressor should be placed again.

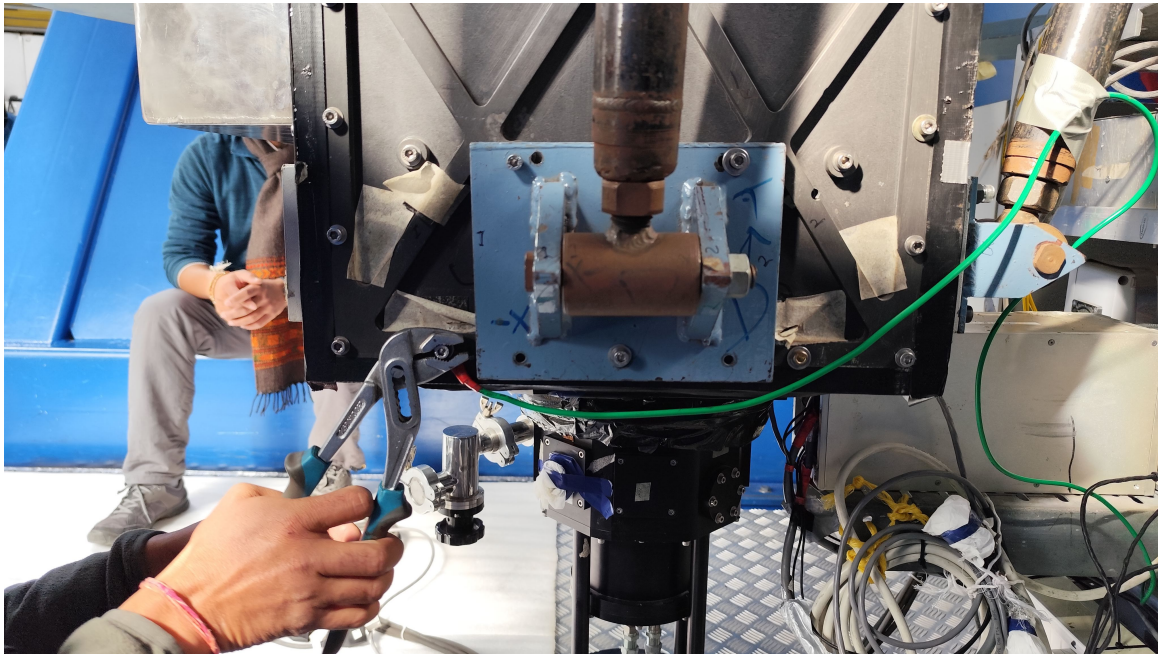


Figure 11: The connection for the grounding can be removed as shown in this figure.

33. Start unscrewing ADFOSC with the inner three screws after which unscrew the outer screws as shown in the top and bottom panels of Fig. 17 respectively. All the screws need to put in one bin then mark and seal the bin for the next mounting.
34. Now slowly move the jack downwards.
35. Now move the transfer trolley backwards while taking care of the wires as shown in Fig. 18.
36. After moving it away from the telescope, cover the instrument (for ADFOSC, use the cover having red color) and bolt it as shown in Fig. 19.
37. Now rotate the dome so the crane and pulley system can arrive over the instrument.
38. Slowly move the pulley downwards and attach the hooks and slings to the instrument as shown in Fig. 20.
39. Move the crane pulley upwards to ensure all the slings are attached tightly and the instrument is ready to be carried down on the ground floor.
40. Now, remove the clamps and move the pulley upwards to remove the side stands so that the instrument will not hit these stands.
41. Now separate the instrument from the jack and transfer the trolley with the help of the crane as shown in Fig. 21.
42. Make ready the instrument stand on the ground floor, then move the edge cover backwards. While doing so, ensure no significant load is on the edge cover.
43. Now move the instrument to the ground floor and place it on the stand securely with the help of rubber pads. During the landing, take care of all the wires. The view of the

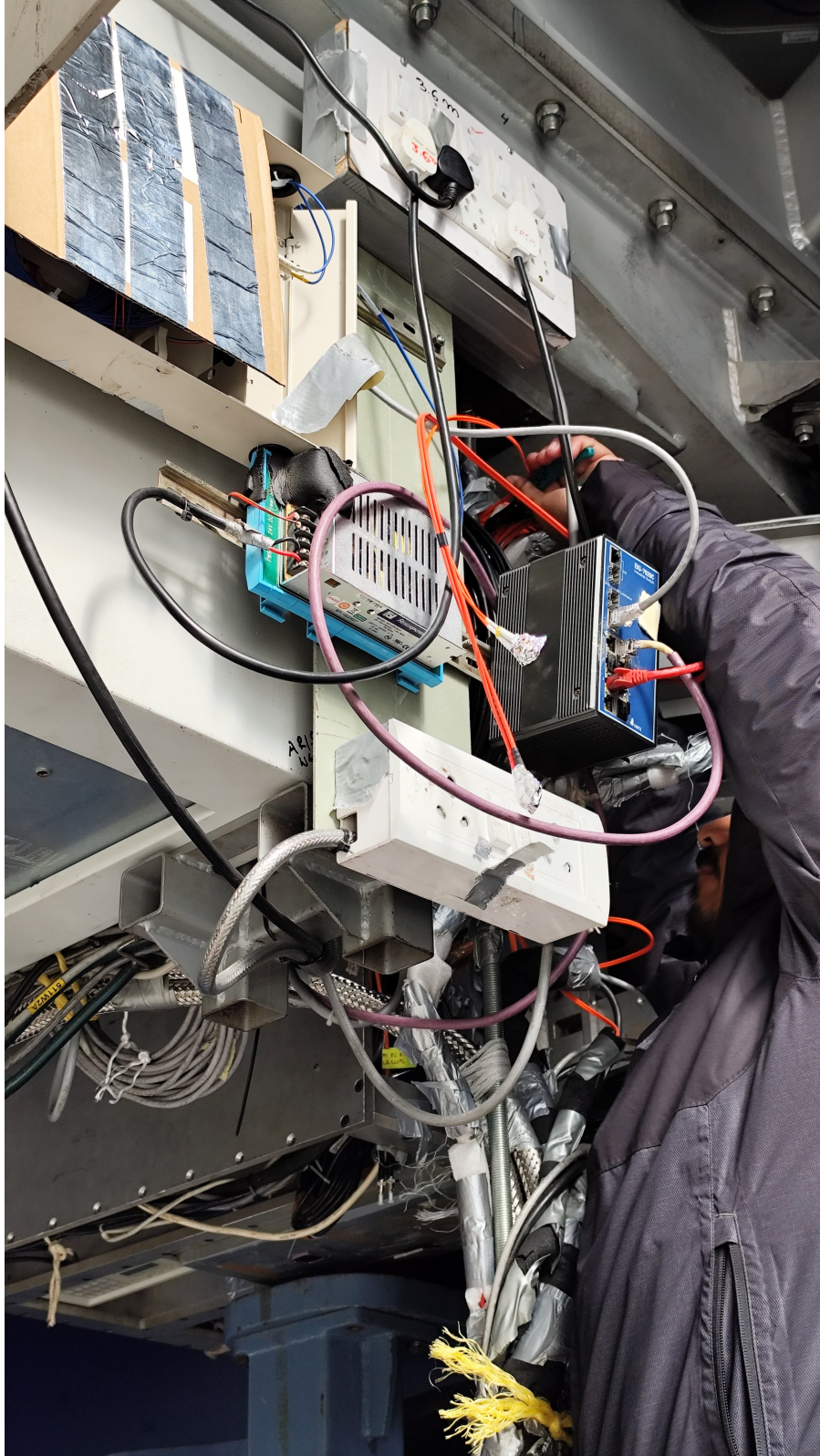


Figure 12: Remove the optical fibers for all the instruments.



Figure 13: Remove the flexure rods by unscrewing them from the bottom and top.



Figure 14: Move the transfer trolley below the instrument.



Figure 15: Mount the stands on both sides of the instrument.

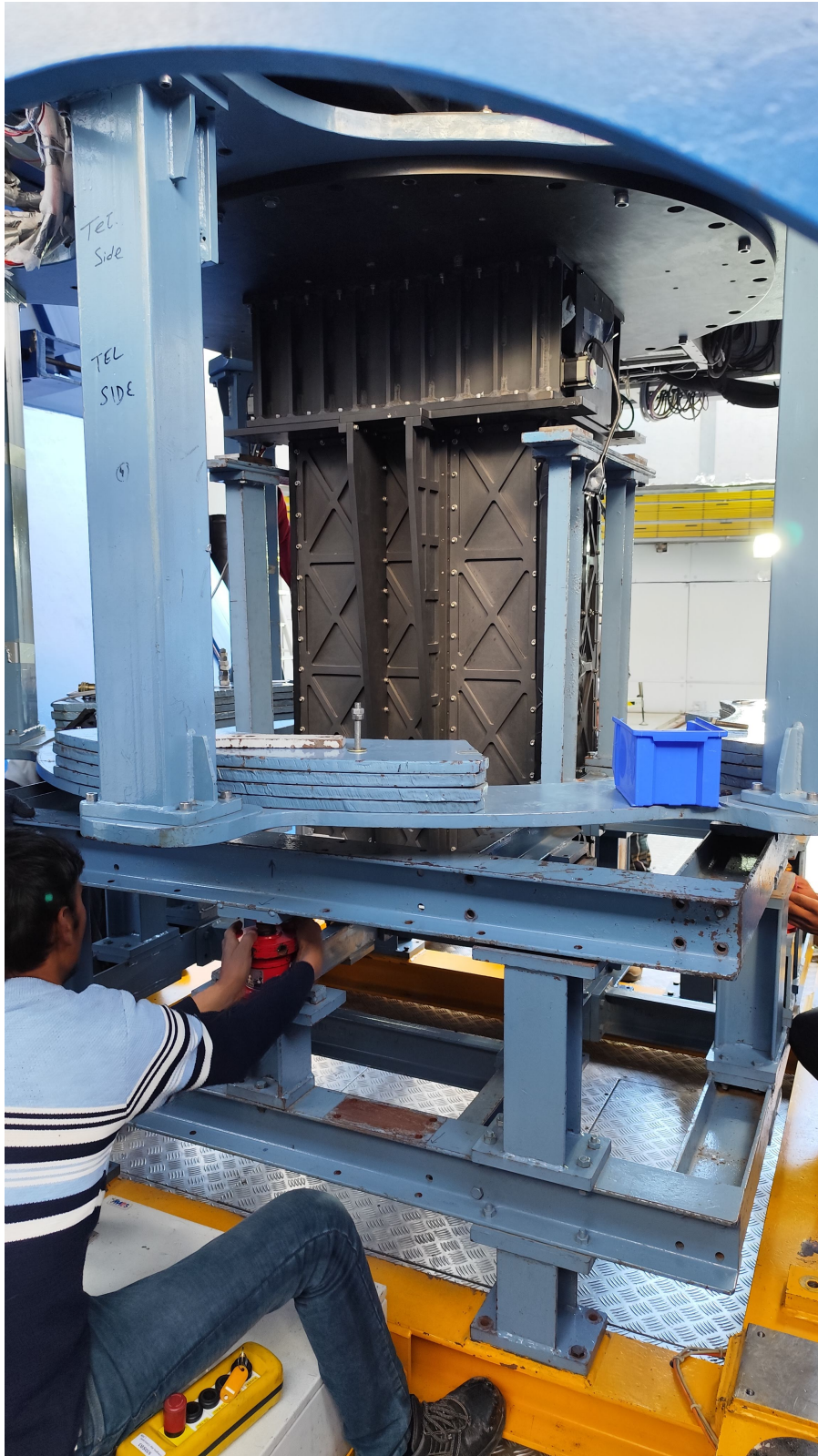


Figure 16: Move the jack upwards while taking care of the wires of the calibration unit.

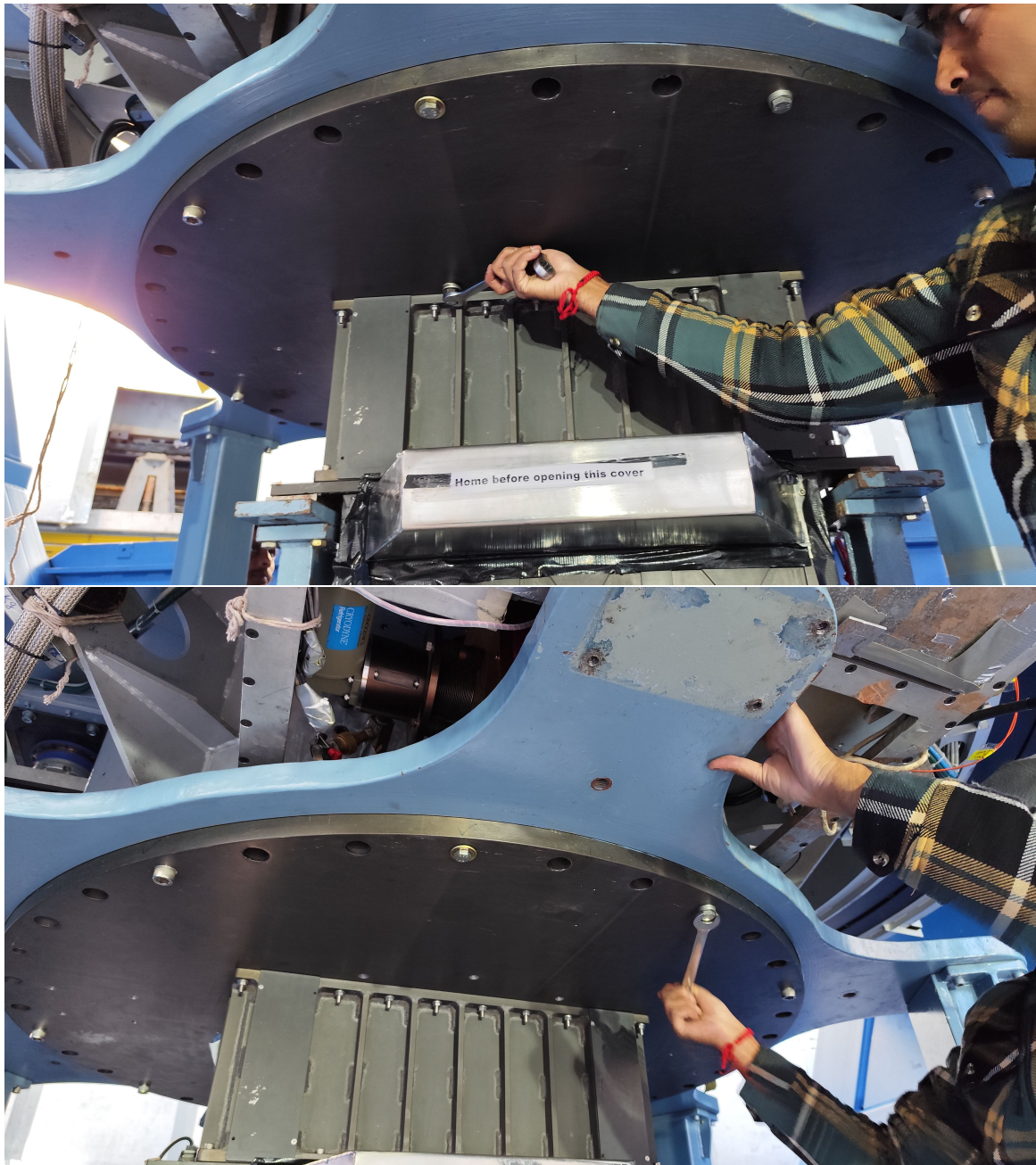


Figure 17: Remove the screws of the instrument starting from inner side to outer side.



Figure 18: Move the transfer trolley holding the instrument backwards.



Figure 19: Cover the ADFOSC with the designated red colored plate.

transportation of the instrument from the telescope floor and ground floor is shown in the top and bottom panels of Fig. ?? respectively.

44. Now remove all the slings and hooks from the instrument as shown in Fig. 23. Move the trolley backwards and align it with the ground floor crane.
45. Reassemble the arm of the dummy back to it and then unmount the dummy from the telescope flange with the help of the ADFOSC unmounting tool as shown in the top panel of Fig. 24. While moving the transfer trolley, always secure the motor wires. Now move the instrument cabinet and dummy to the ground floor one by one with the help of the crane as shown in the bottom panel of Fig. 24.
46. Store the instrument, cabinet, and dummy safely at their designated place on the ground floor.



Figure 20: Attach the hooks to the instrument for its connection with the crane pulley.

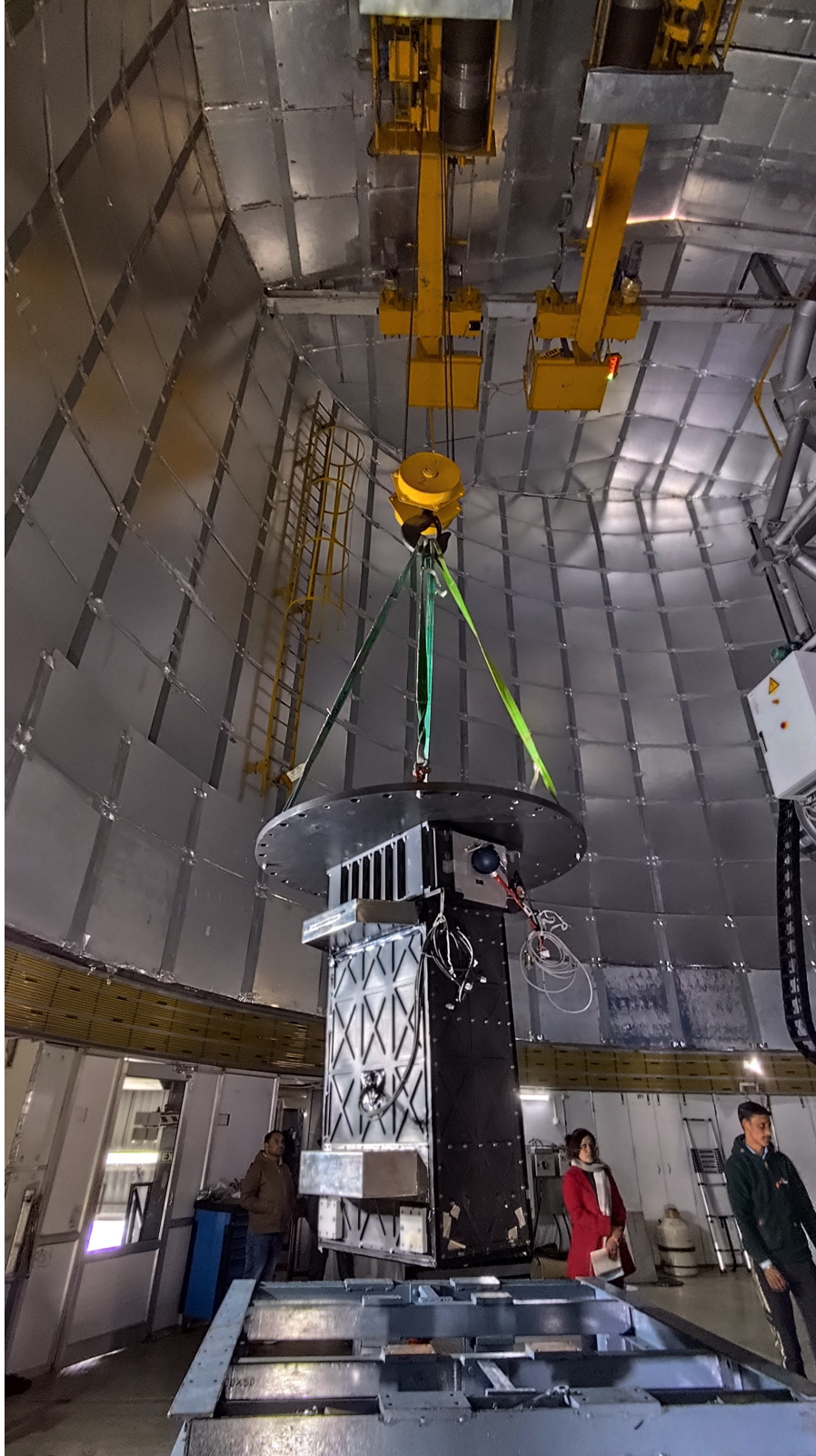


Figure 21: Detach the instrument from the jack and transfer the trolley by moving it upwards.

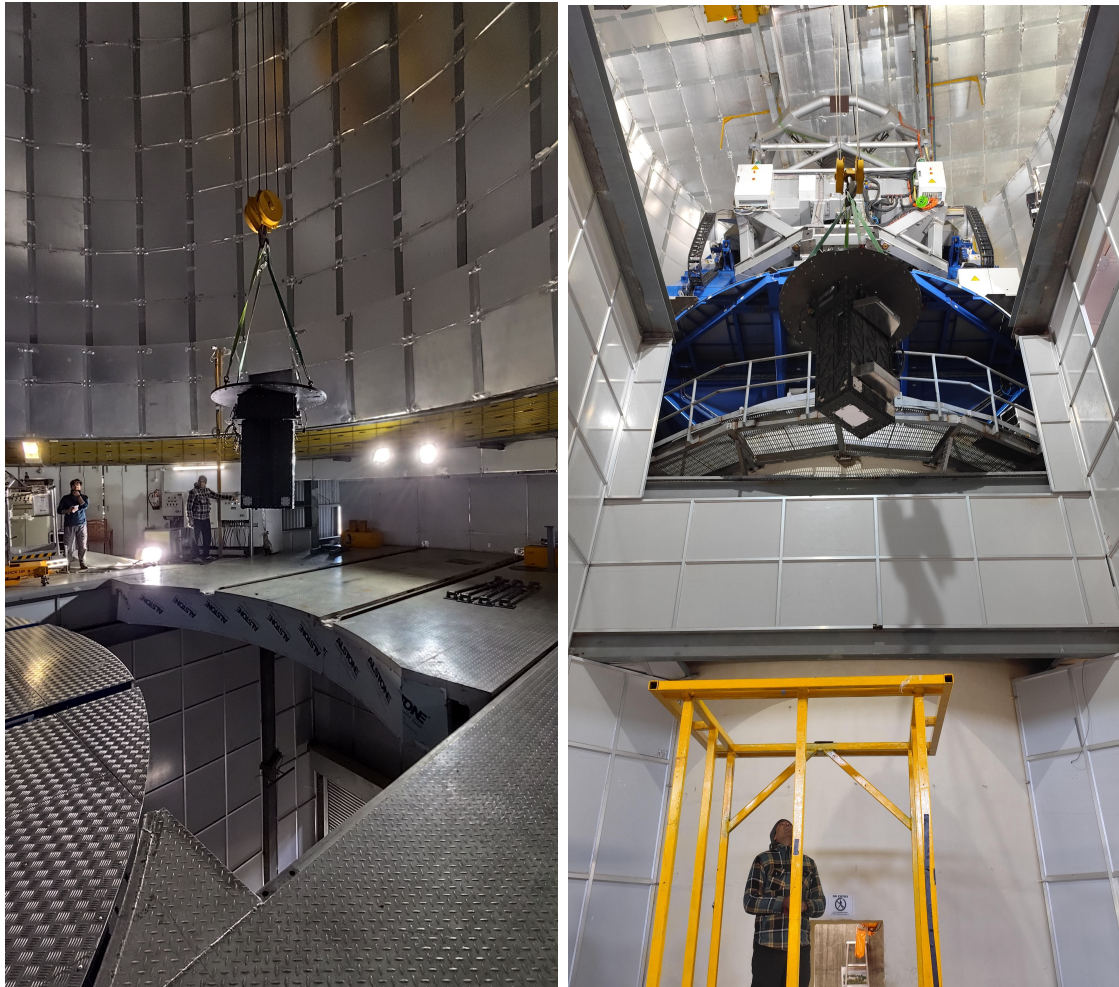


Figure 22: Top to bottom: The view of instrument transportation from the telescope and ground floor respectively.



Figure 23: Remove the slings and hooks from the instrument.



Figure 24: Top to bottom: Move the dummy with the help of the transfer trolley then transfer it to the ground floor.