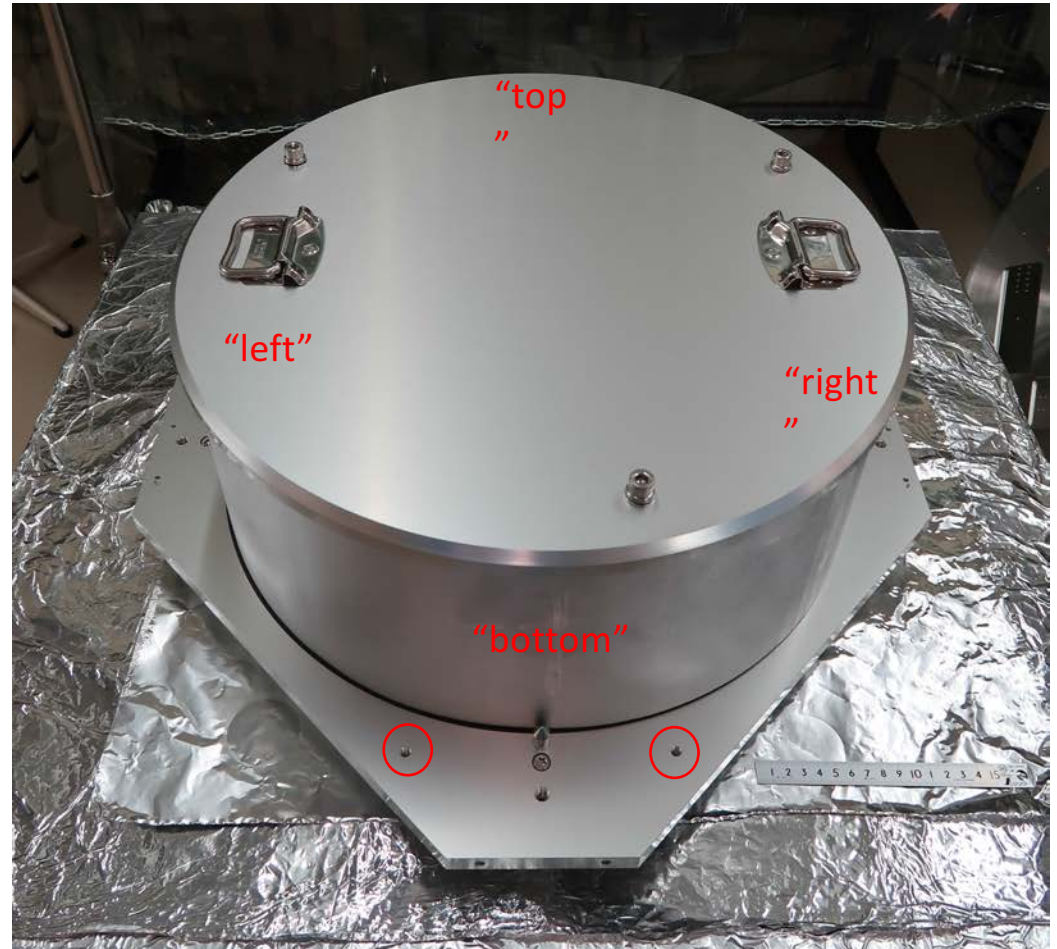


# BS Gluing Procedure

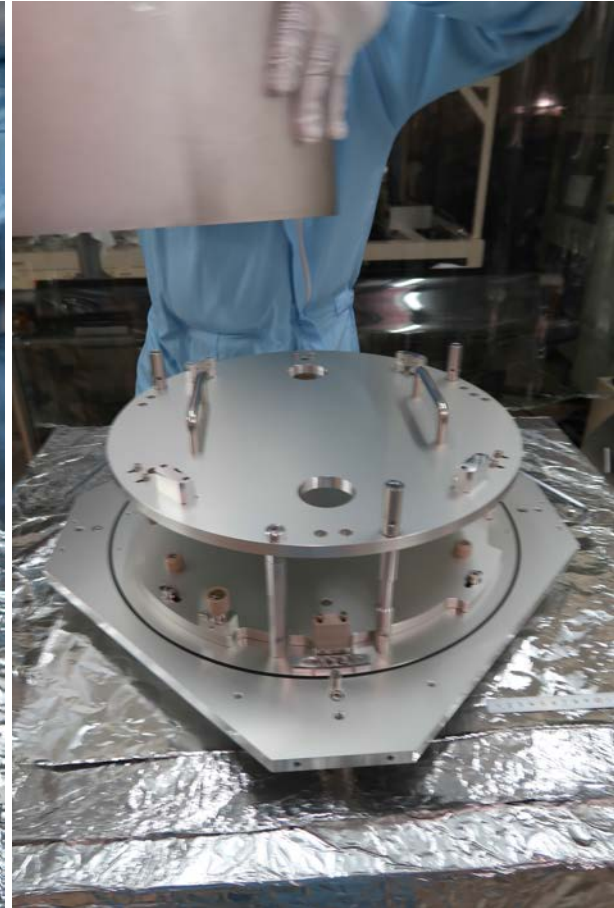
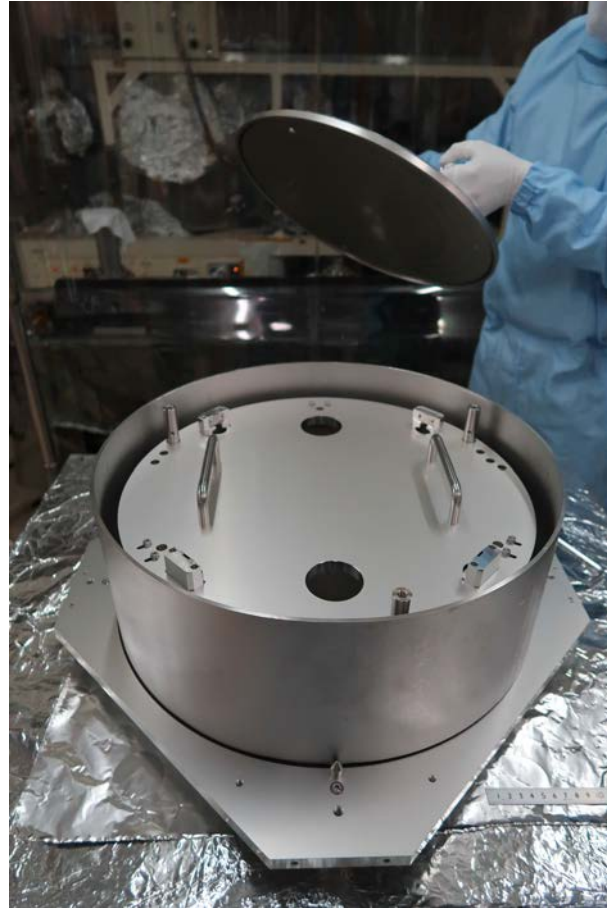
Mark Barton, Fabian Peña-Arellano

JGW-E1605505-v1

- Bring in the mirror box and set it up on a work table, with the corner that will become the bottom (with the two holes) at the front.

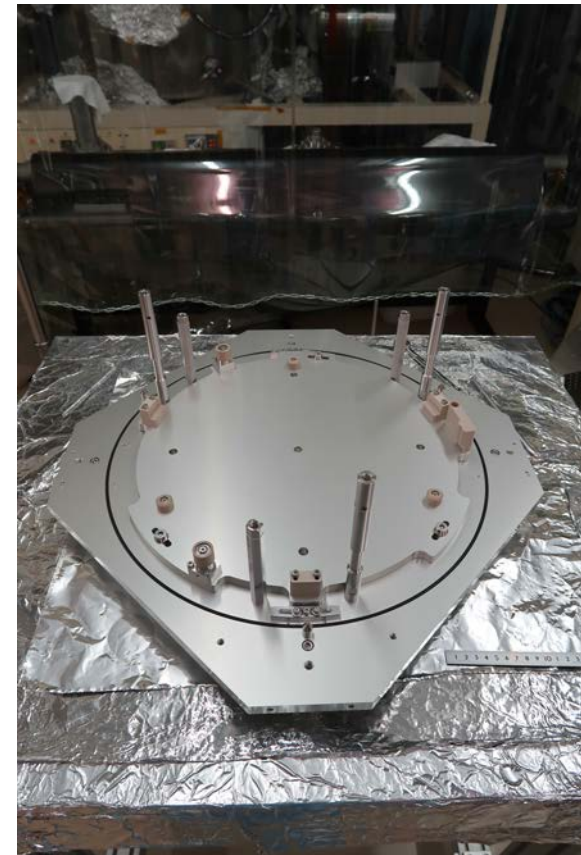
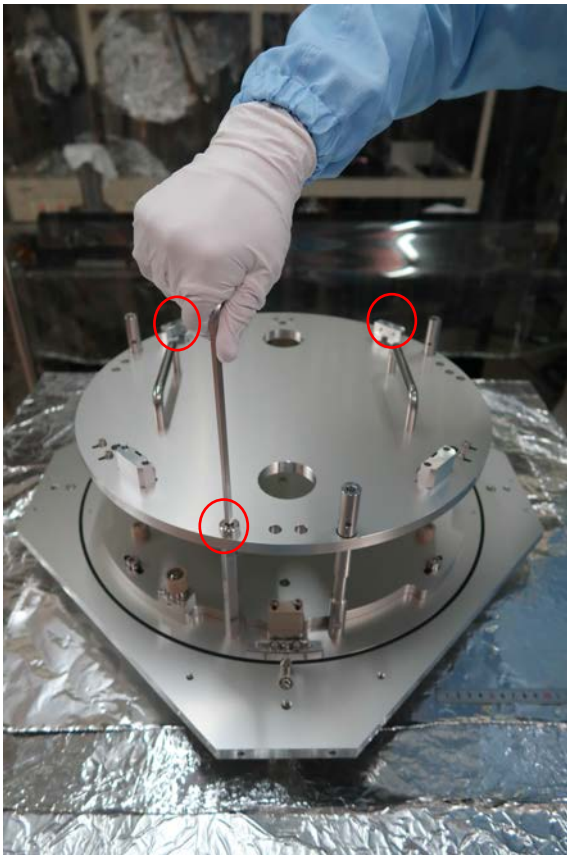


- Remove the lid (three screws) and cylinder.





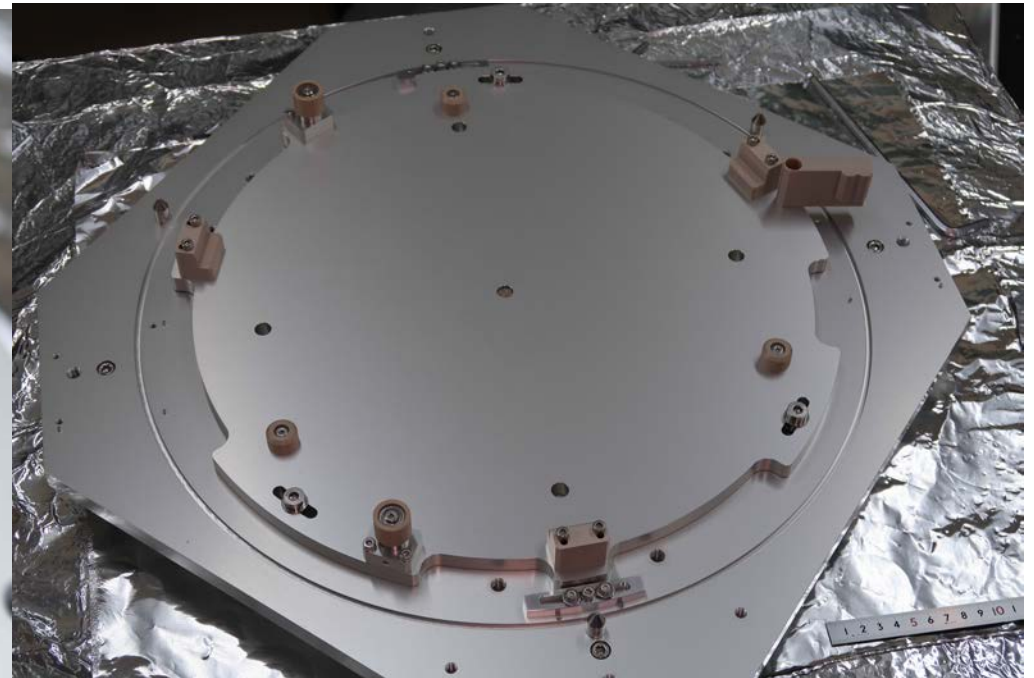
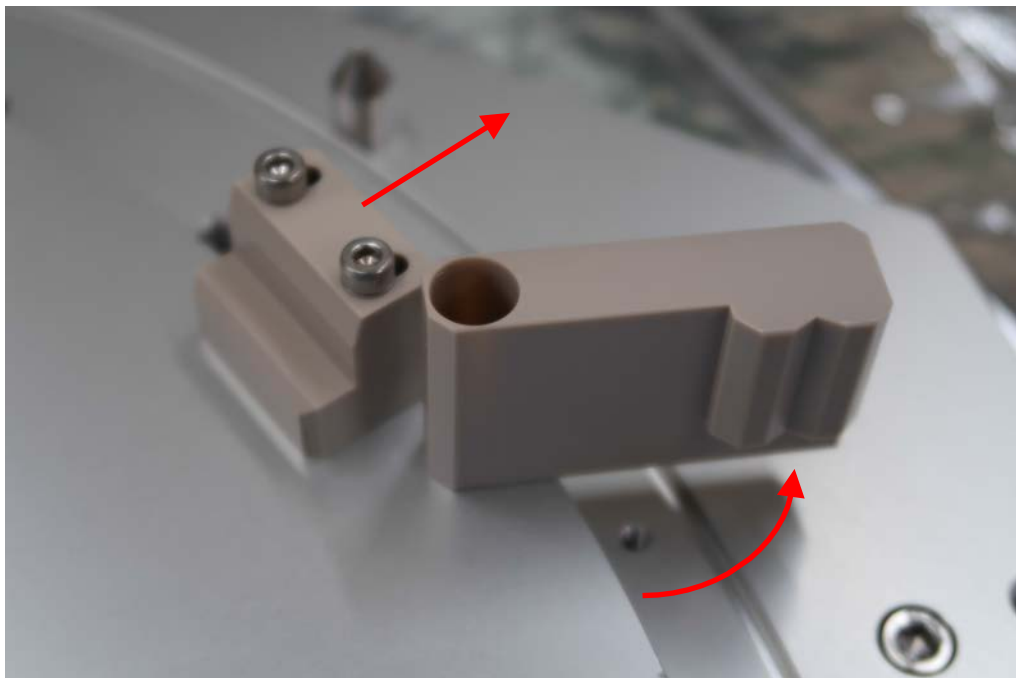
- Remove the top plate (three custom screws).



- Remove all pillars (three long, three short) with a 13 mm wrench.
- Remove the O-ring (pinch a section between two fingers to make it pop out).



- Retract the three L brackets to outside (2 screws each).
- Open the “gate”.

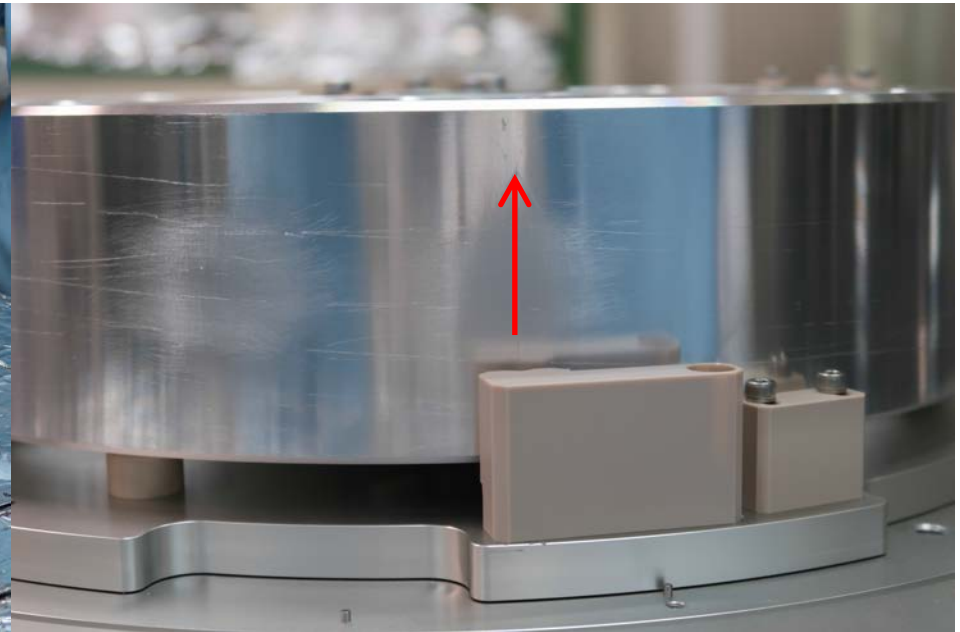




- Bring in the optic with the engraved arrow on the side at right and pointing up.
- Lower the optic carefully onto the three PEEK feet.



- While supporting the weight of the optic, press it against the stops at the left and rotate it till the arrow is level with the notch in the gate.
- There is no need to be very precise in the rotation at this point.

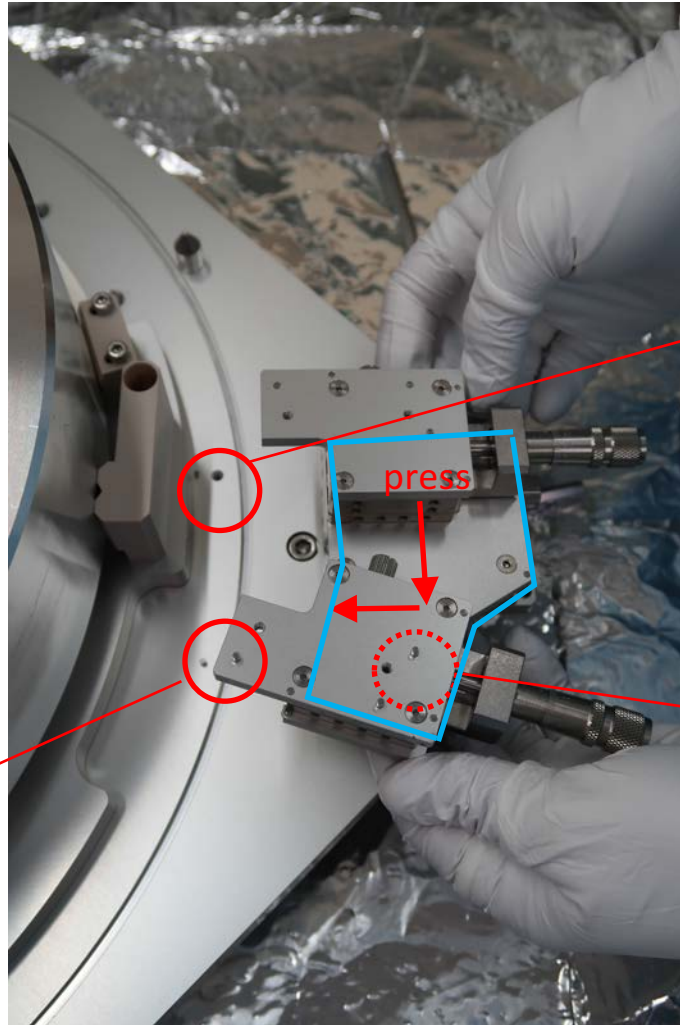
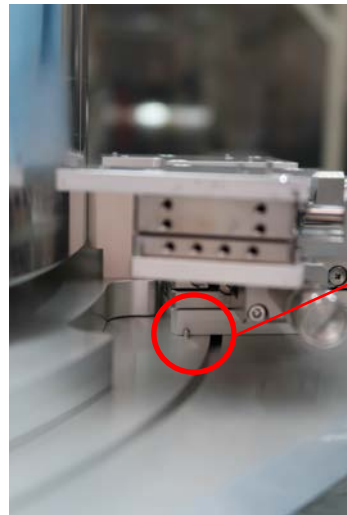




- Move three L-brackets in to gently touch the optic and tighten (two screws).

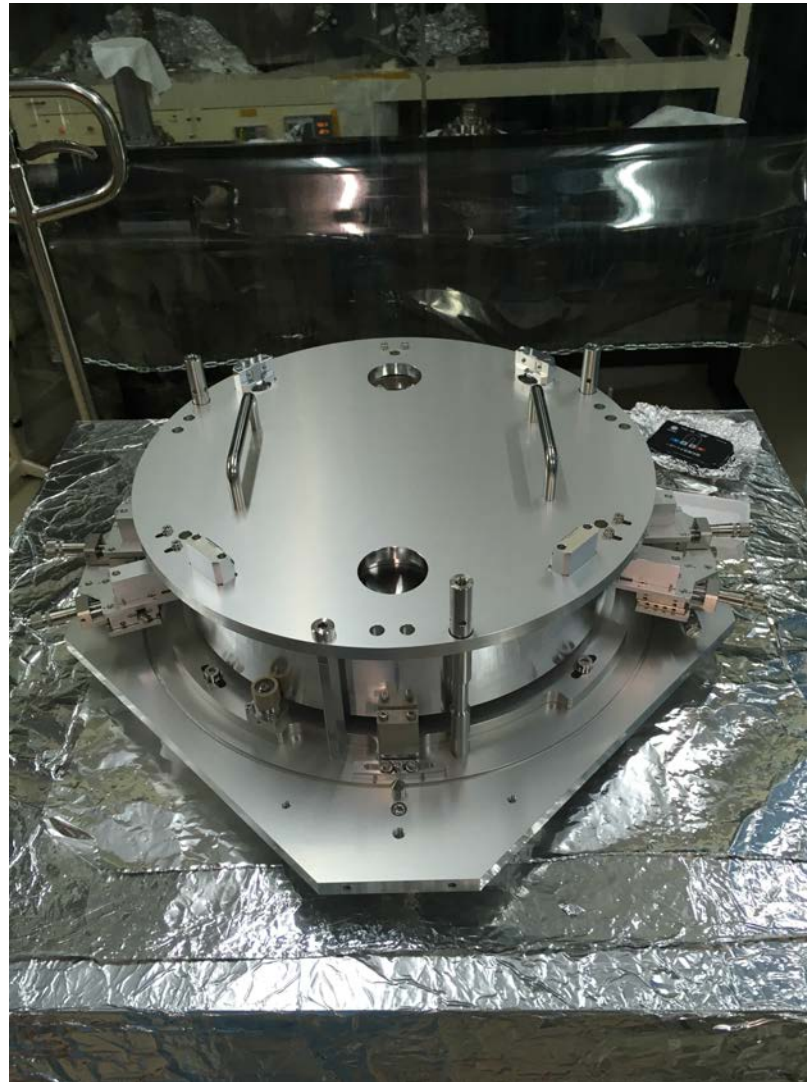


- Install two translation stage assemblies, big end to top, pressing each of them down and in against the three locating pins and secure with 3 M4 screws.

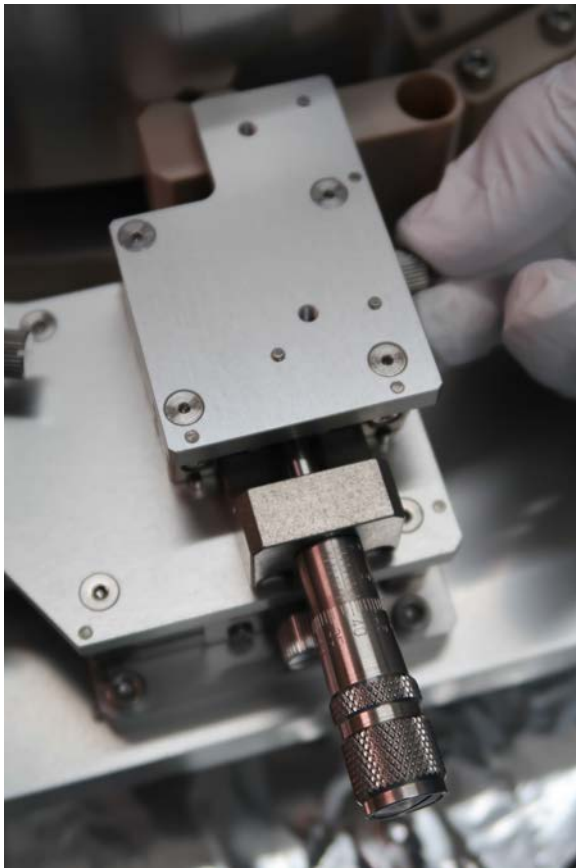


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- Cover with foil or cloth (in case of dust) and wait 24 hours.
- Note: it is not possible to put the ring and lid on because the translation stage interfere.



- Undo the lock screws on the translation stages for the primary prisms, and withdraw the stages till they are about 7 mm from the optic.

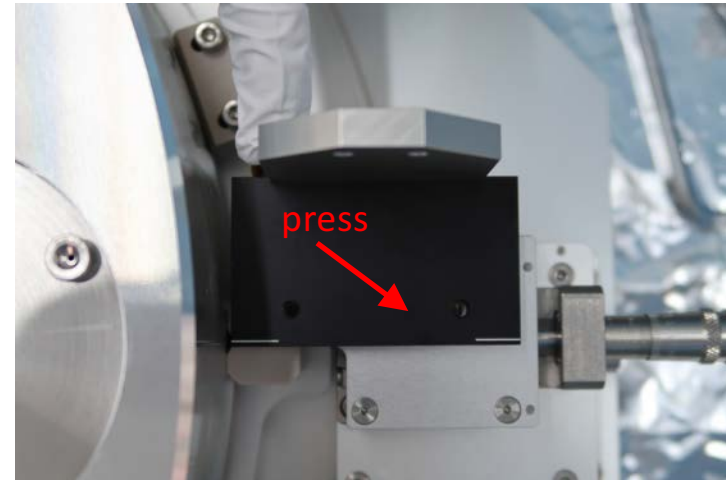




- Install the lens brackets (less lenses) on the translation stages with the AI parts to the top, pressing them out and down against the locating



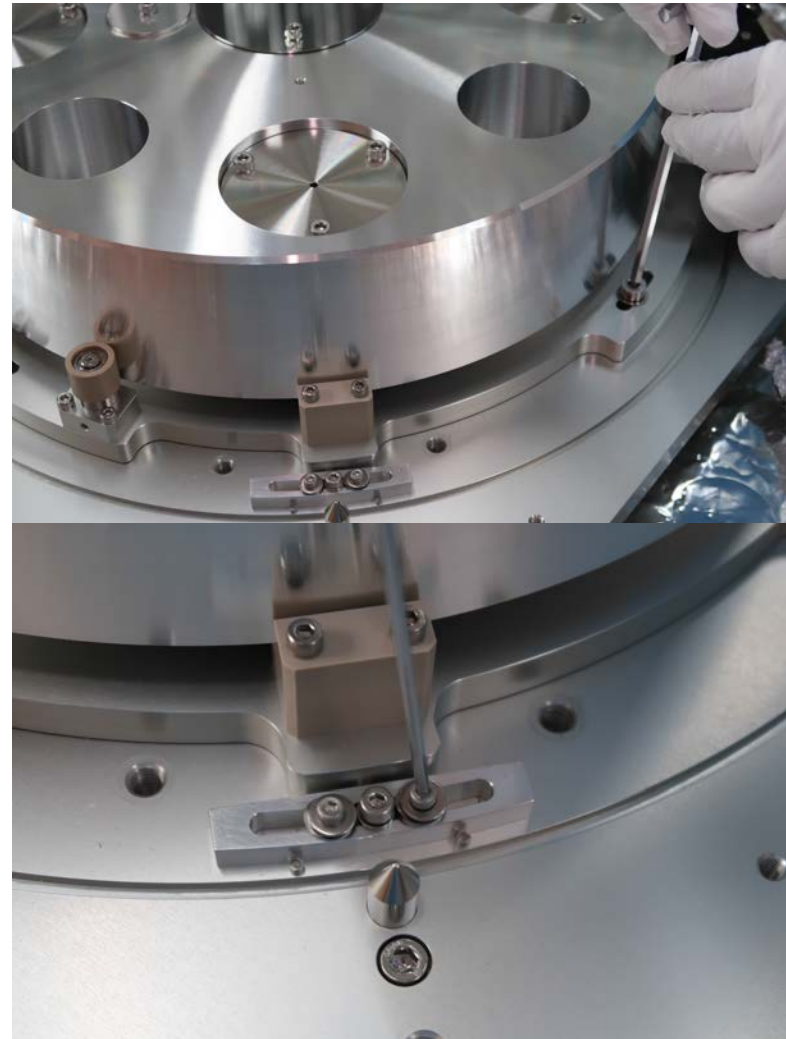
2



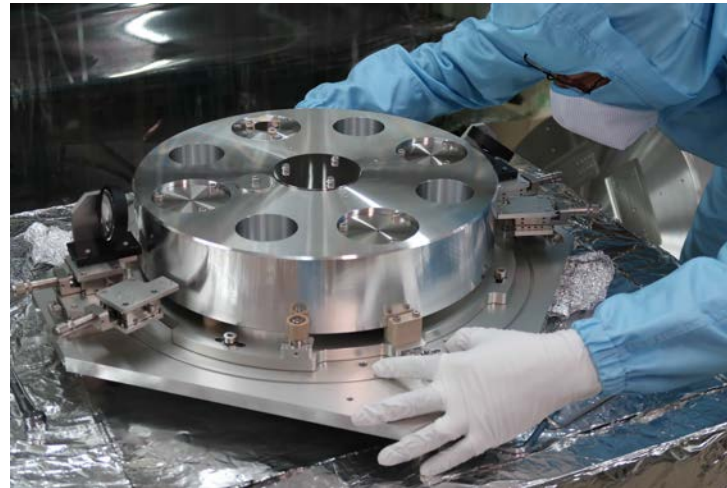
- Install the lenses with the flat sides out in the holes nearest the optic.
- Wind the translation stage in until the corner of the lens bracket with the scribe line is very close to the optic.



- Loosen the 3 turntable lock screws.
- Also loosen the two groups of détente mechanism screws (two M3 and one M4 in each group).

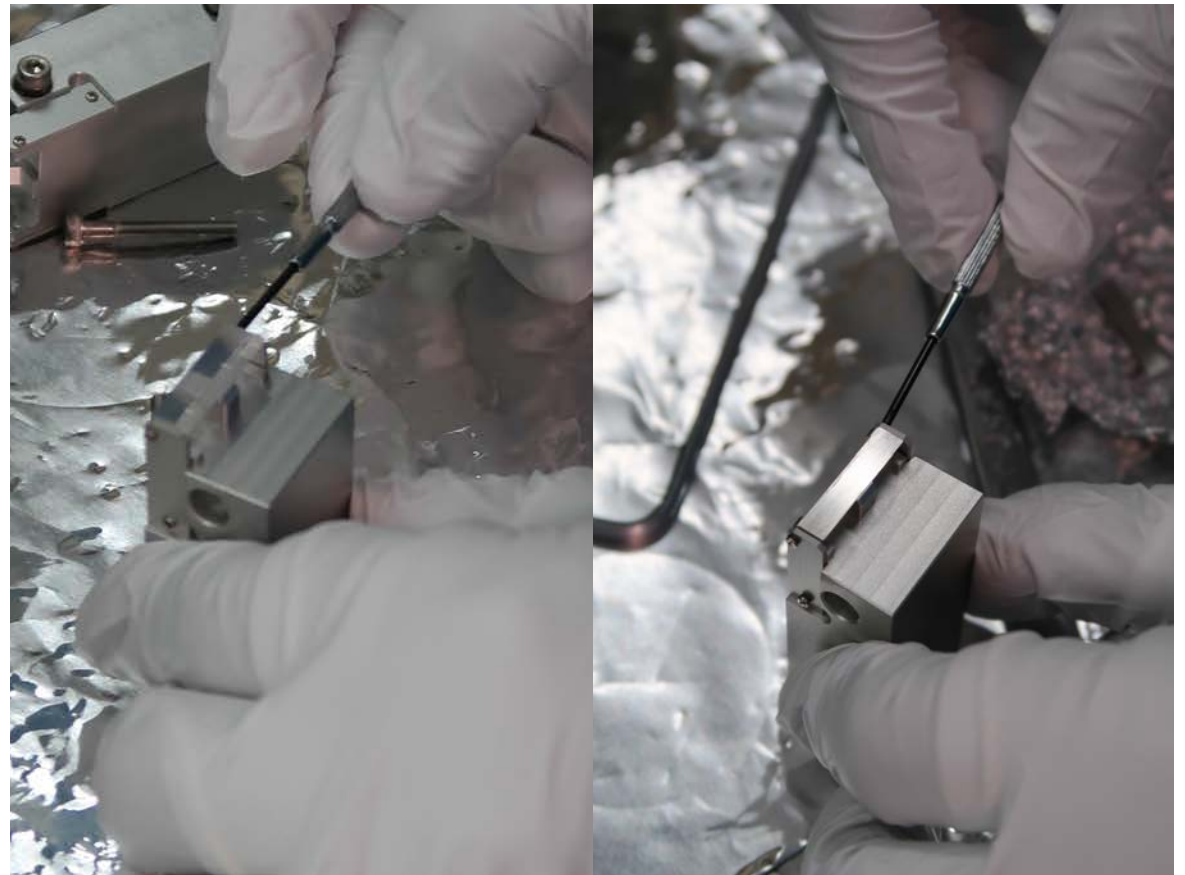


- Rotate the optic by pressing on the détente mechanisms until the arrow mark lines up with the scribe line on the lens bracket.
- Lock the detente mechanisms and the turntable.
- TBD: figure out how to use the second lens. (Will there be a scribe line on the real optic?)
- Remove the lens brackets and wrap the screws for storage.

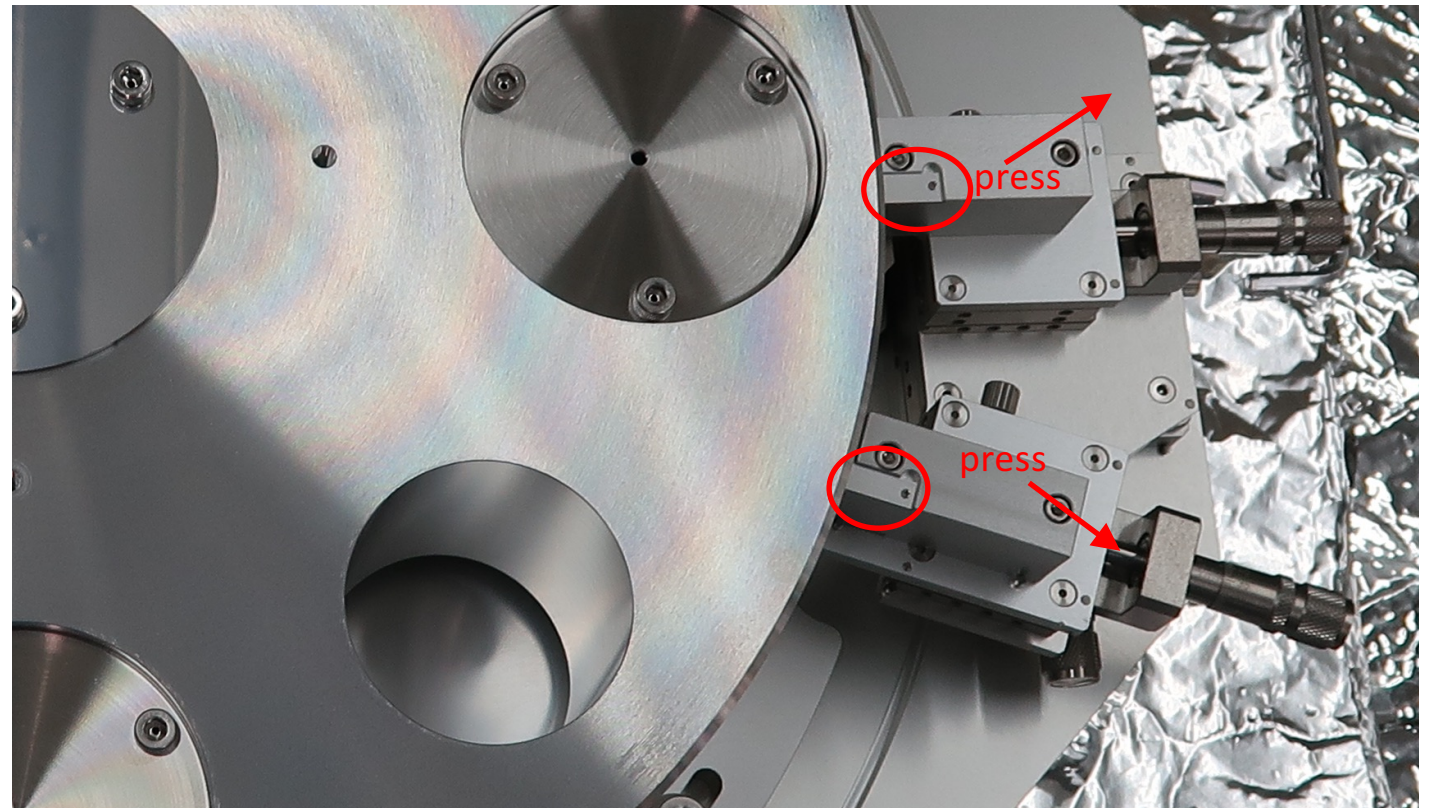




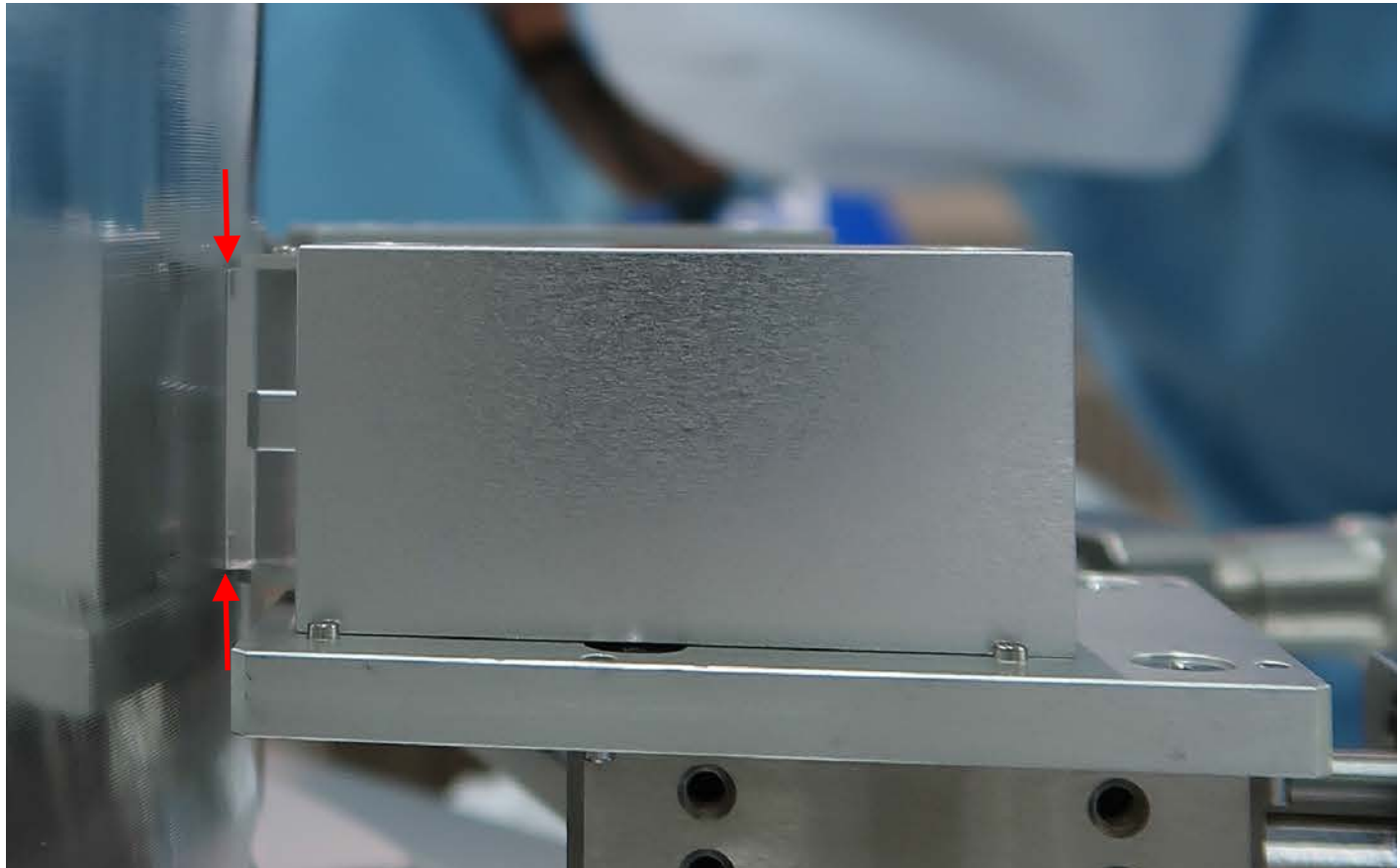
- Put two 6-mm sapphire primary prisms and two 5-mm secondary prisms in the prism holders and tighten the screws just enough to prevent them falling out.



- Mount the prism holders on the translation stages.
- The prism holders are symmetrical and can easily be put on upside down. In all cases, the prism should be toward the bottom.

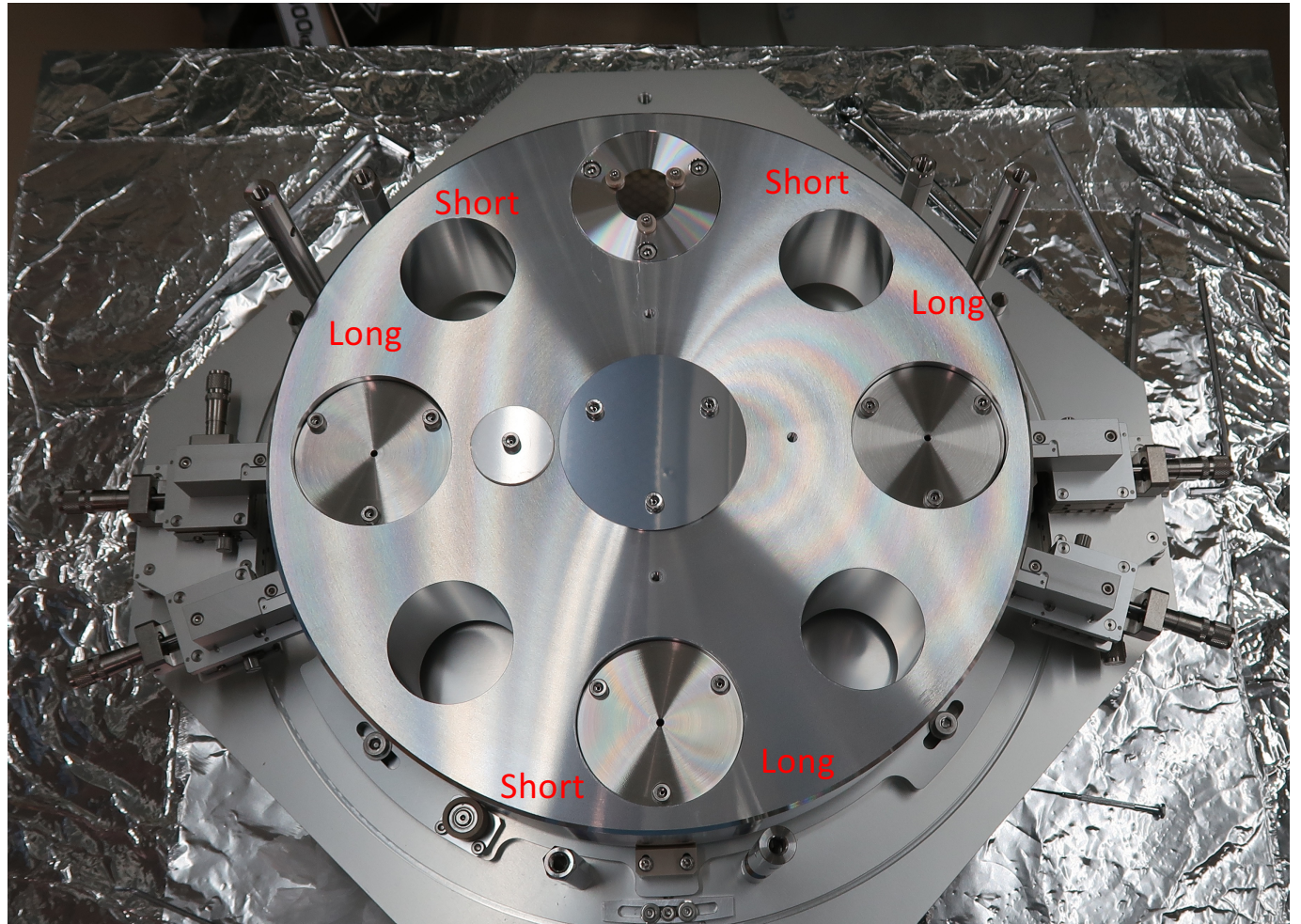


- Screw the translation stages in until the prisms touch the optic and check that each prism is well aligned with the barrel.





- Replace the pillars

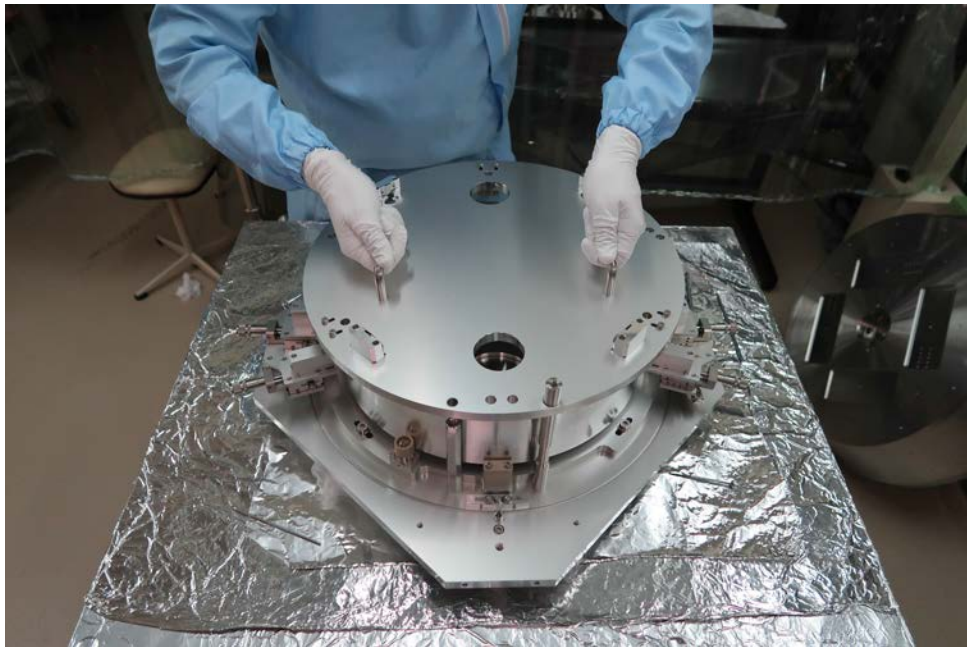




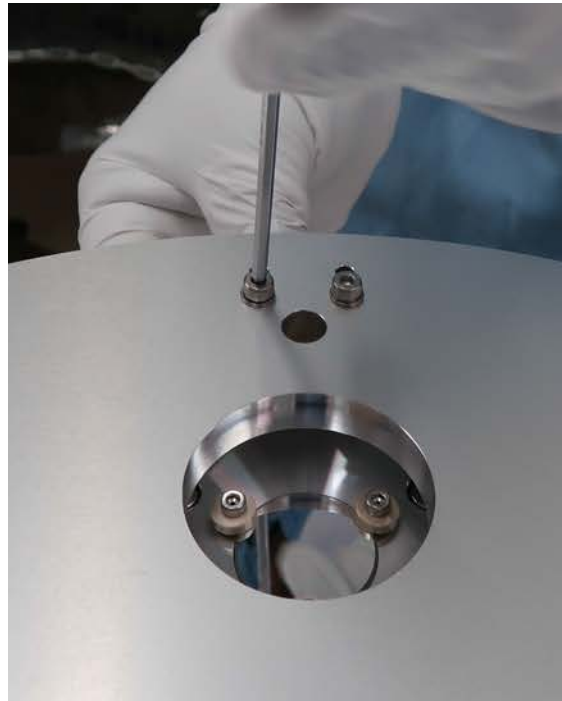
- Screw in the PEEK screws on the three L-brackets on the top plate so that they are below the lower edge of the plate.
- Loosen the metal screws and slide the L-brackets to the outside.



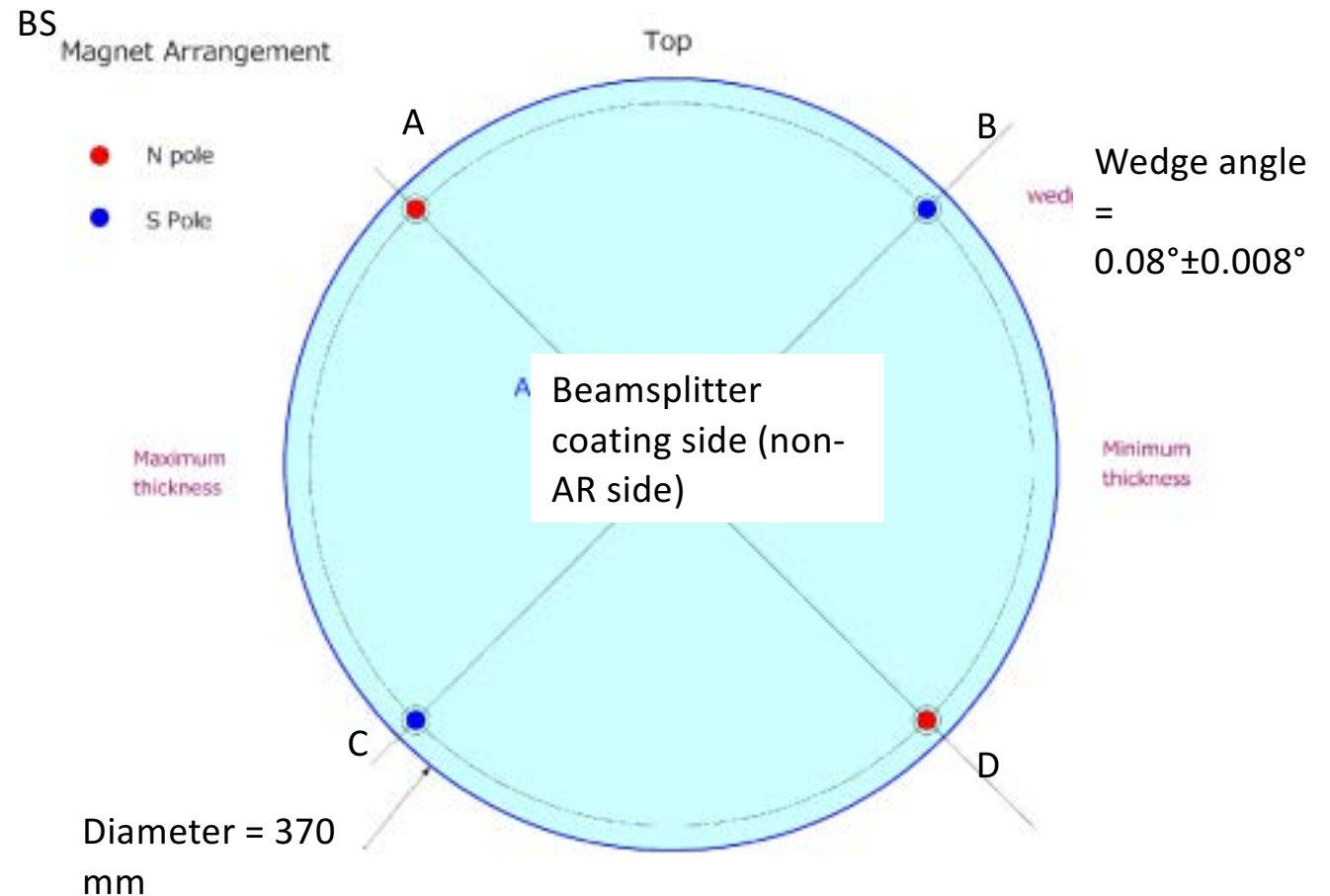
- Place the lid over the pillars. The handles should be at left and right.
- Secure with three custom screws into the short pillars.



- Loosen the metal screws on the three L-brackets on the top plate, slide the L-brackets to touch the barrel of the optic, and retighten.
- Screw the PEEK screws down to touch the face of the optic.

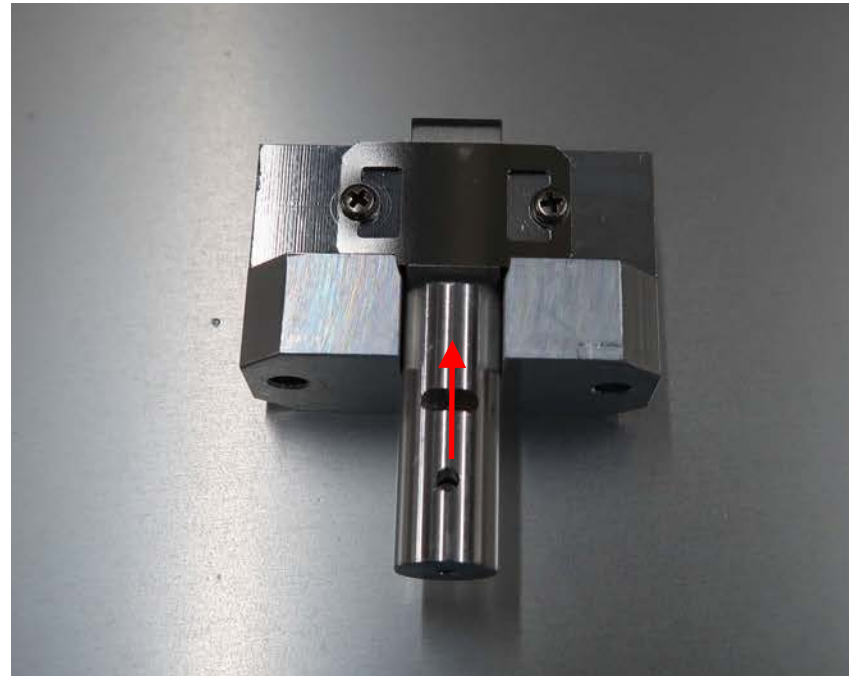
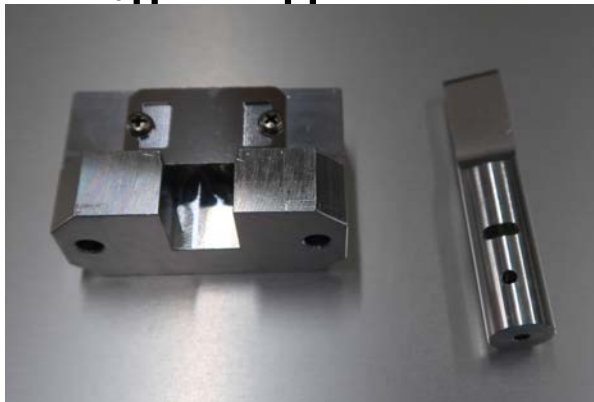


- Test the flags with the magnet tester and place them near the optic at the corners where they will go: flags with N towards the tip at top left and bottom right, and flags with S toward the tip at bottom left and top right.





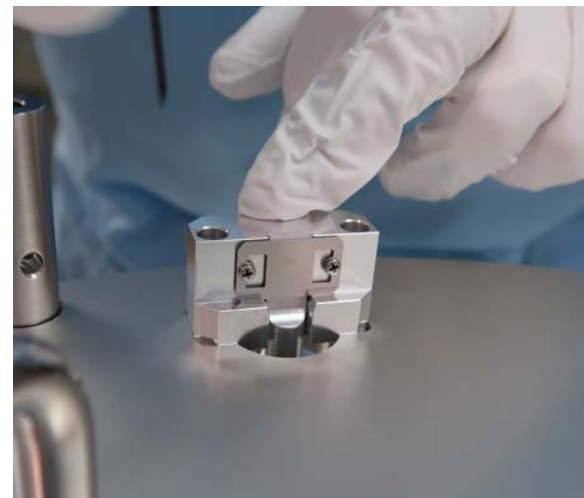
- One at a time, remove the OSEM holders and install a flag.
- Push each flag in as far as it



- Make up the glue per JGW-E1504248:
  - 0.275 g of glass beads
  - 0.5 g of EP30 Part B
  - 5 g of EP30 Part A
- Cumulative weights
  - 0.275 g
  - 0.775 g
  - 5.775 g
- Mix well with a spatula for several minutes.



- Put the flag holder in the recess in the top plate with the flag towards the center. Check that it is well seated.
- Loosen the flag plate screws until the flag drops onto the surface and then retighten.

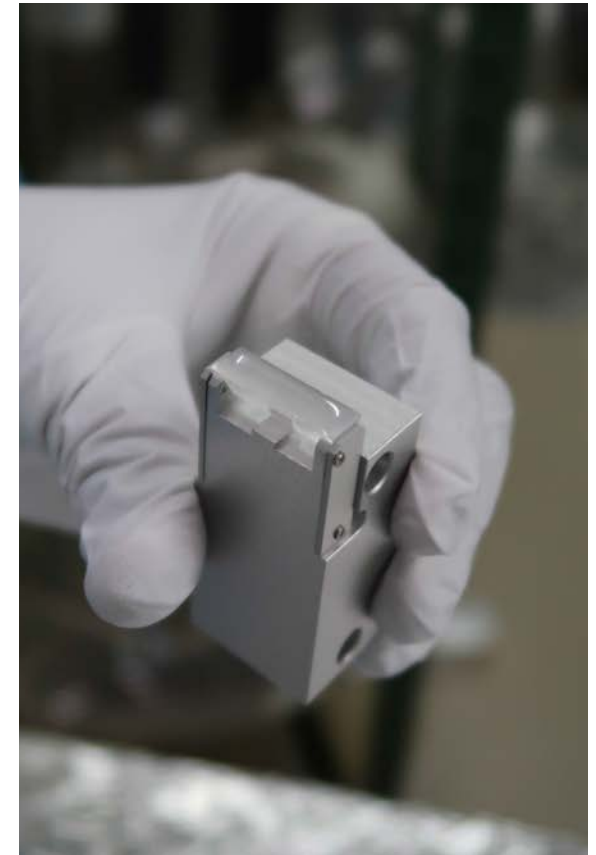
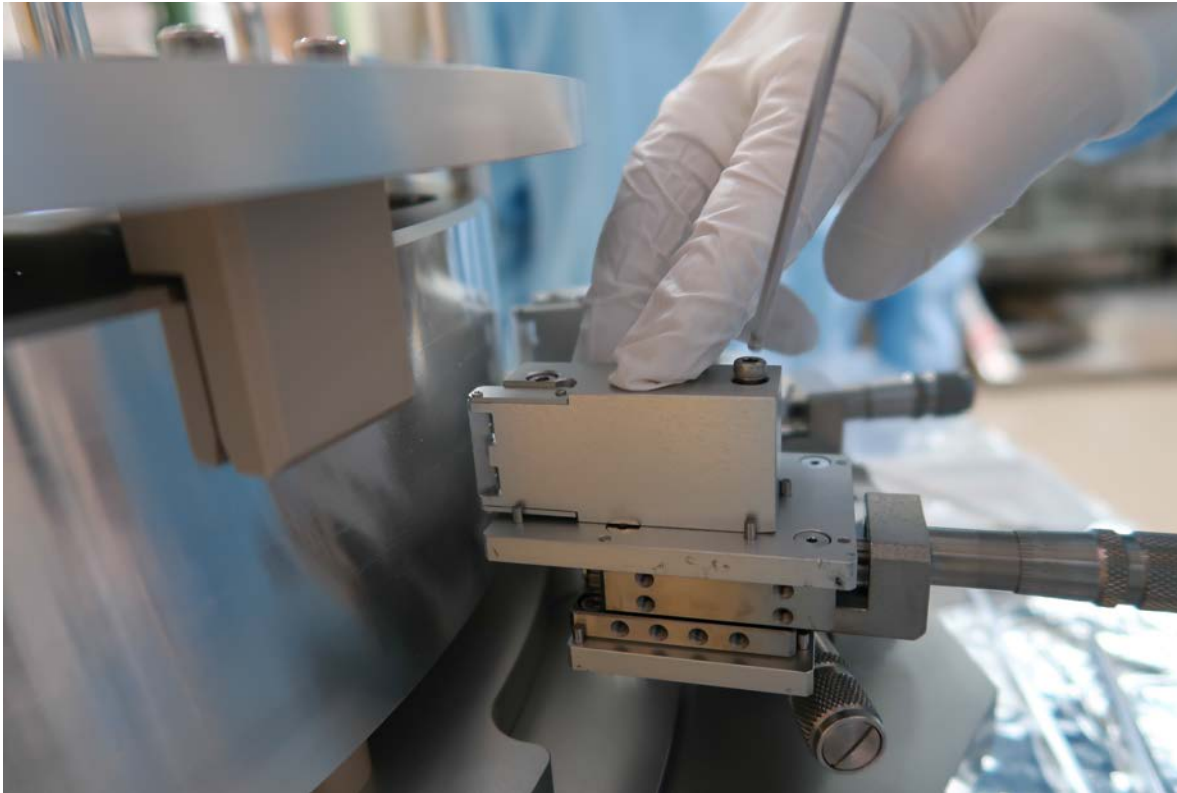


- For each flag, remove the flag holder, smear TBD amount of glue on the base of the flag, place the flag holder back into the recess and let it drop onto the optic.
- Check that squeezed out glue is visible around the edges of the flag base, but that the amount is not excessive. Insert the flag holder screws and tighten very gently.





- For each prism, retract the translation stage, remove the prism holder and smear TBD amount of glue on the base of the prism.



The amount of glue shown above is probably a bit too generous, even for bonding to rough aluminium. The real optic will need rather less.

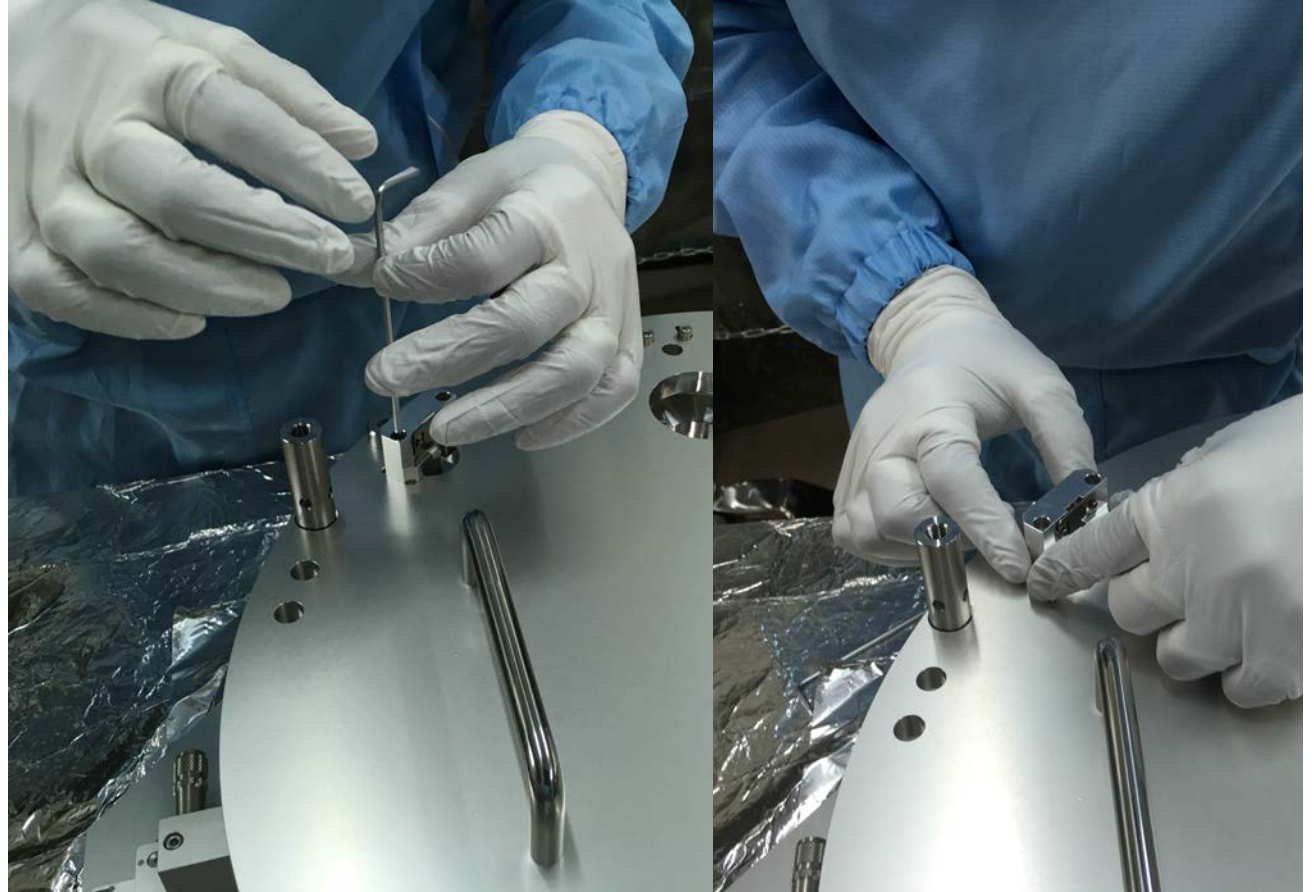
- Mount the prism holder back on the translation stage.
- While the translation stage is still retracted, use the tip of the spatula to even up the glue (it will tend to pool at the bottom of the prism) and then quickly screw in the translation stage till the prism touches.



- Check that glue is visible around the edges of the prism, but that the amount is not excessive, and that it has not run onto the prism holder.

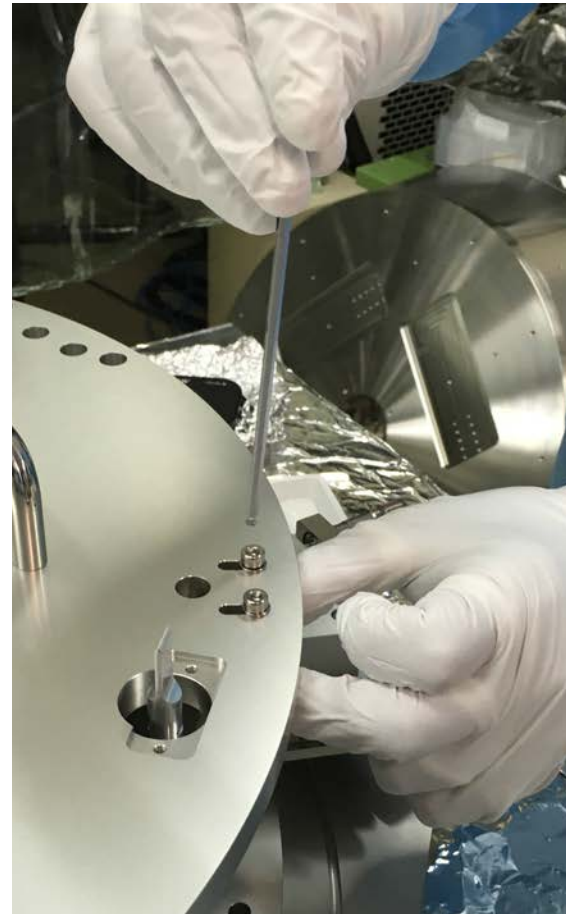
With the real optic, also check the coverage by viewing *through* the optic.

- For each flag, check that the flag plate screws are loose, then remove the flag holder screws.
- Very carefully, lift the flag holder off vertically.





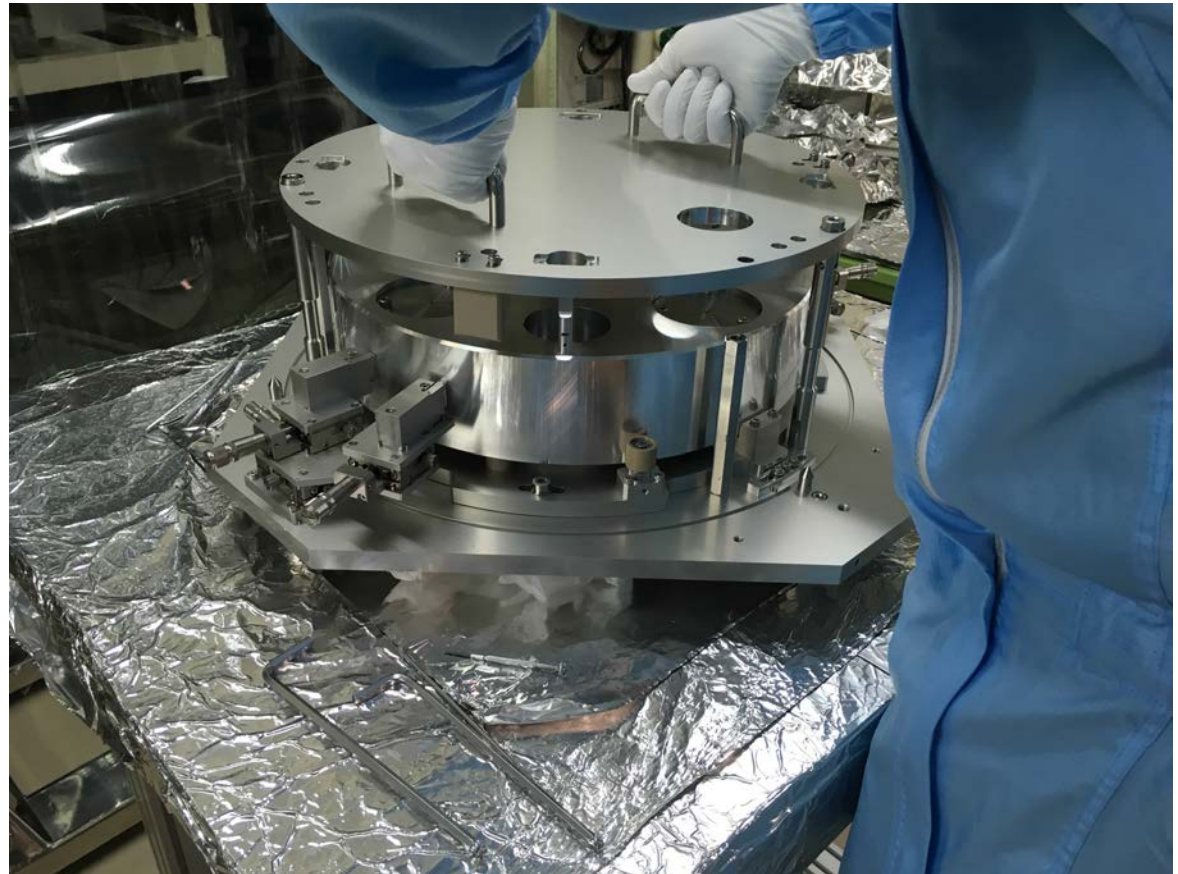
- Remove the three screws holding the top plate, being *extremely* careful of the two near the flags.



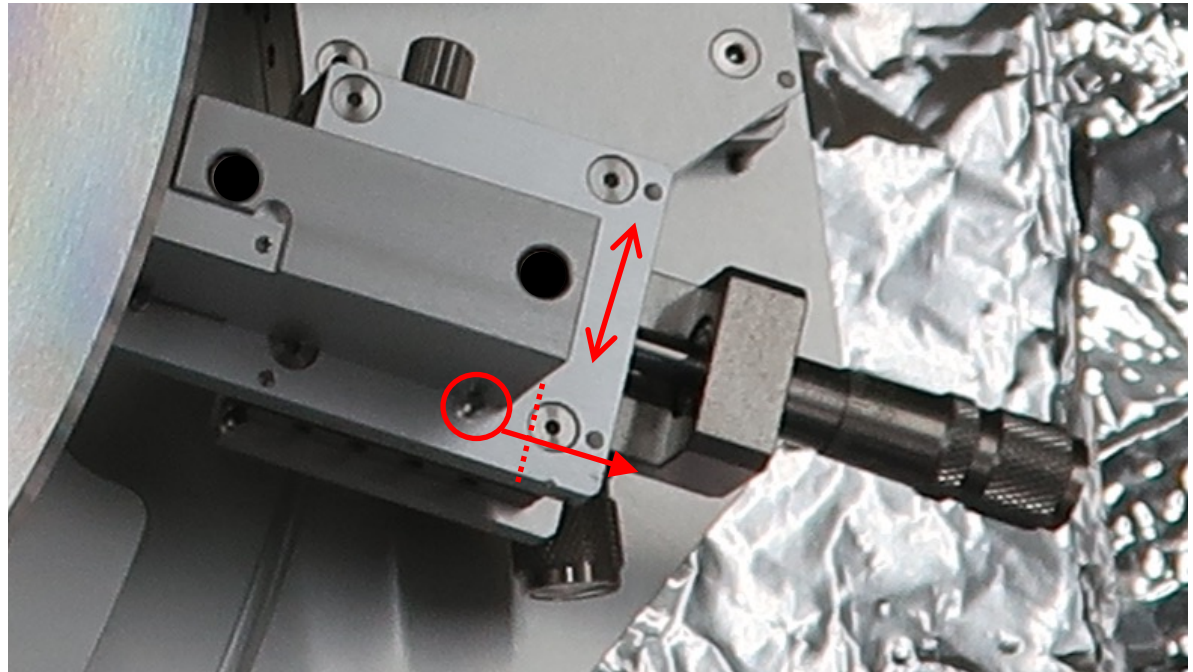
- Retract the L-brackets (two visible screws and one in the hole).



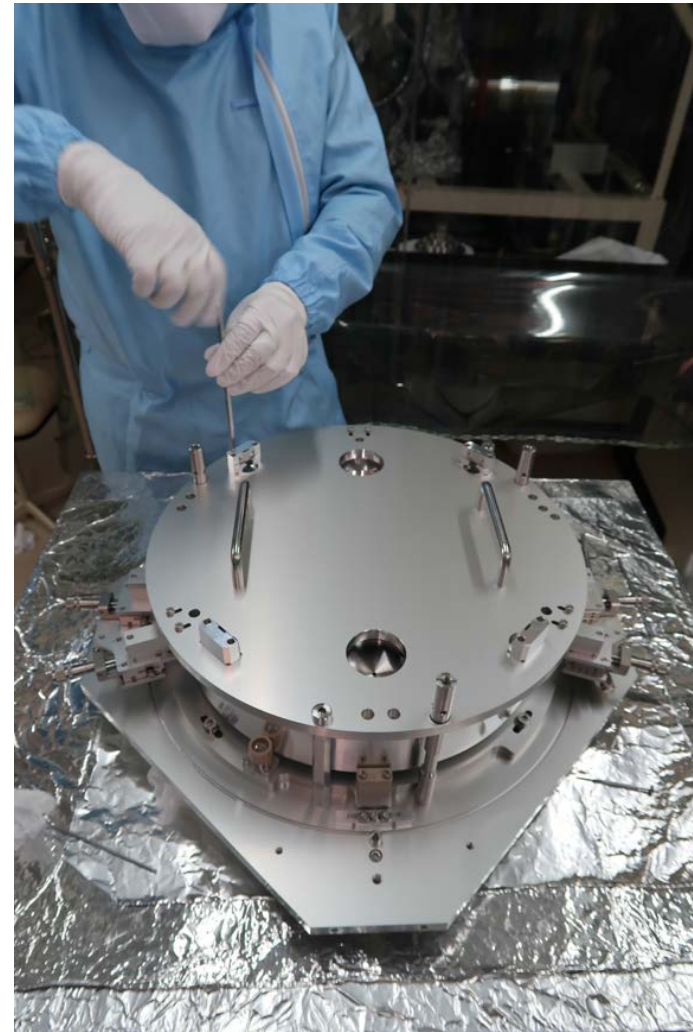
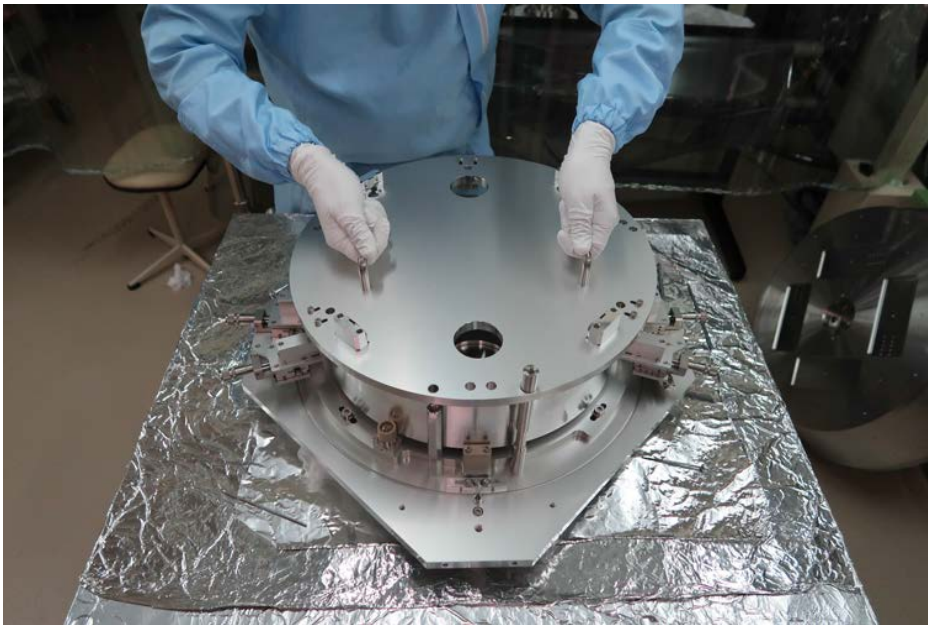
- Lift off the top plate, being *extremely* careful of the flags.



- Remove the screws holding the prism holders and retract the translation stages a few mm, until the rear locating pin is clear of the holder .
- If the prism holder has become glued to the optic or prism, jiggle the back of it gently until it comes free.
- Otherwise just lift it off.



- Replace the top lid and screws, being extremely careful with the ones near the flags.



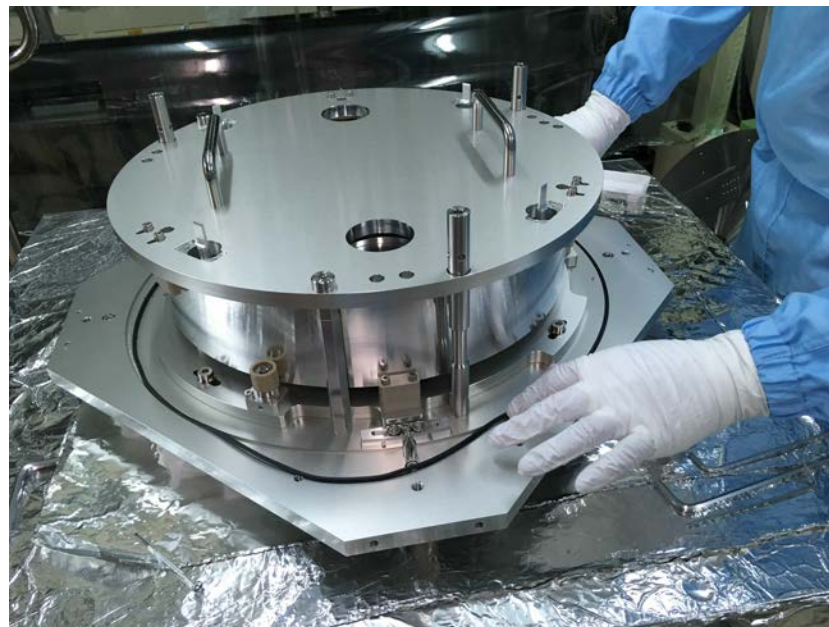
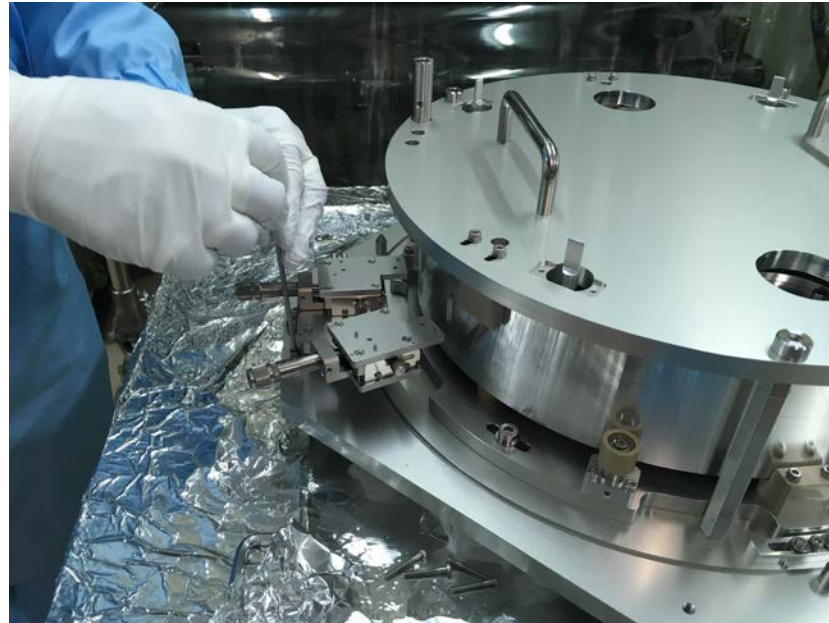


- Move the L-brackets to touch the optic and tighten the screws, being extremely careful with the ones near the flags.
- Screw the PEEK screws down to touch the optic.





- Remove the translations stages.
- Insert the O-rings, being extremely careful not to let it catch on the flags.



- Replace the cylinder and lid, and fasten with 3 screws.
- Ship it!

