



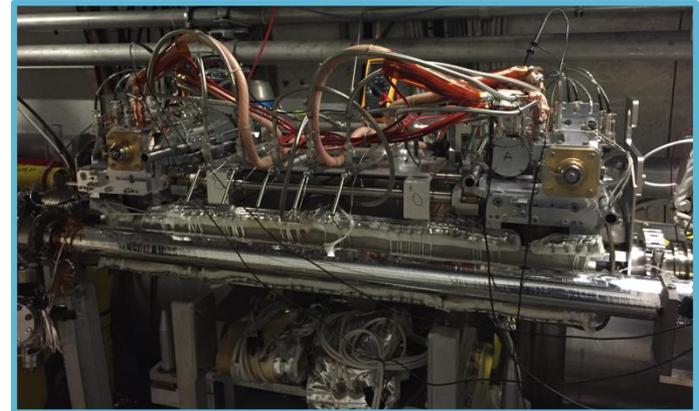
## **Moving of two wire collimators for BBLR compensation from B2 to B1 on IR1 and IR5**

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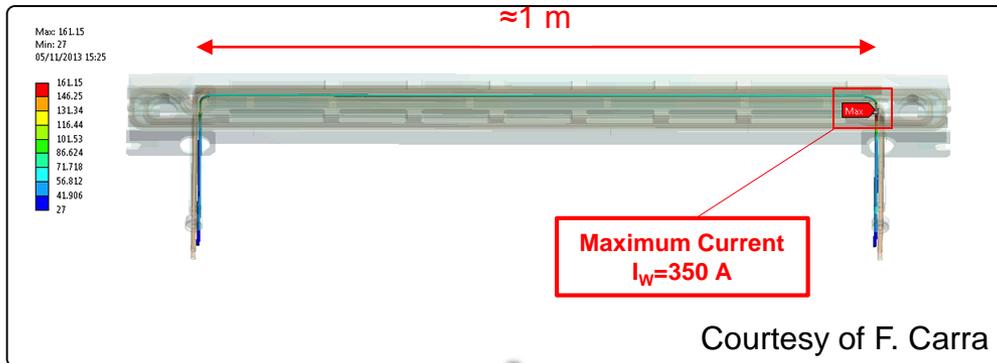
# Wire-in-jaw collimator demonstrator

- LHC wire demonstrators are embedded in the jaw of operational tertiary collimators.
- 1-m long Cu wire of 2.48 mm diameter capable to carry up to 350 A.

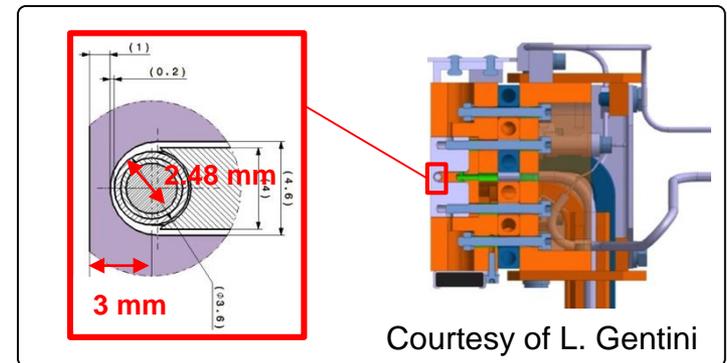


Front view

Top view



Courtesy of F. Carra

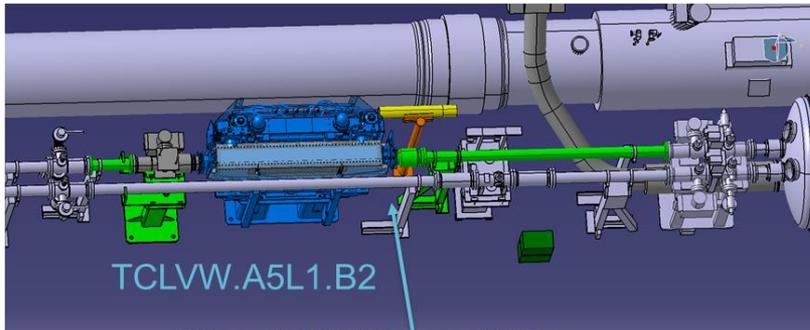


Courtesy of L. Gentini

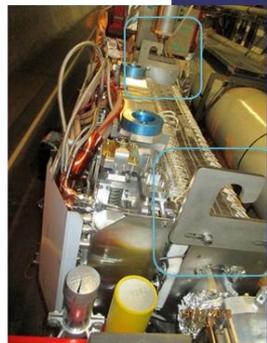
# Contribution required

- HSE-RP (dose planning)
- TE-VSC (vacuum)
- EN-STI (collimators)
- EN-SMM (alignment and collimator motors)
- EN-HE (transport)
- TE-EPC (power converter)
- EN-EL (cabling for junction boxes)
- EN-ACE (coordination and integration)
- BE-BI (wires and pick-ups)
- BE-ABP & BE-CO (commissioning)
- TE-MPE & rMPP (interlocks)

# Replacement of TCTPV.4L1.B1 with the TCTW collimator coming from slot TCLVW.A5L1.B2, and installation of a vacuum chamber in slot TCLVW.A5L1.B2



~5mm clearance on Drawing. Collimator lifting plate re-machined to avoid interference

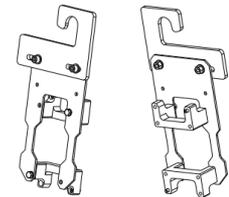


TCTPV.4R1.B2  
Courtesy of I. Lamas Garcia  
EN-STI



TCTPV.4L1.B1

~5682mm



# Replacement of TCTPV.4L1.B1 with the TCTW collimator coming from slot TCLVW.A5L1.B2, and installation of a vacuum chamber in slot TCLVW.A5L1.B2

- The TCTW collimator presently in slot TCLVW.A5L1.B2 (not an operational collimator) will be replacing the tertiary collimator in slot **TCTPV.4L1.B1**
  - The orientation of the TCTW collimator will be flipped longitudinally to fit in the slot.
- Slot TCLVW.A5L1.B2 will be replaced with a vacuum chamber type VCDSS (ID80, L=1.48m, 2 QCF100 flanges), supported with new supports that will replace the collimator base.
- Required
  - venting of the B2 line between Q4 and Q5 and B1 line between the TAN and D2, left of IP1,
  - alignment of the collimator in slot TCTPV.4L1.B1 and bake-out.
- The wire junction box next to the TCLVW.A5L1.B2 will need to be moved next to the TCTPV.4L1.B1.

# De-installation of the TCTW in slot TCLVW.A5L1.B2 and installation in slot TCTPV.4L1.B1

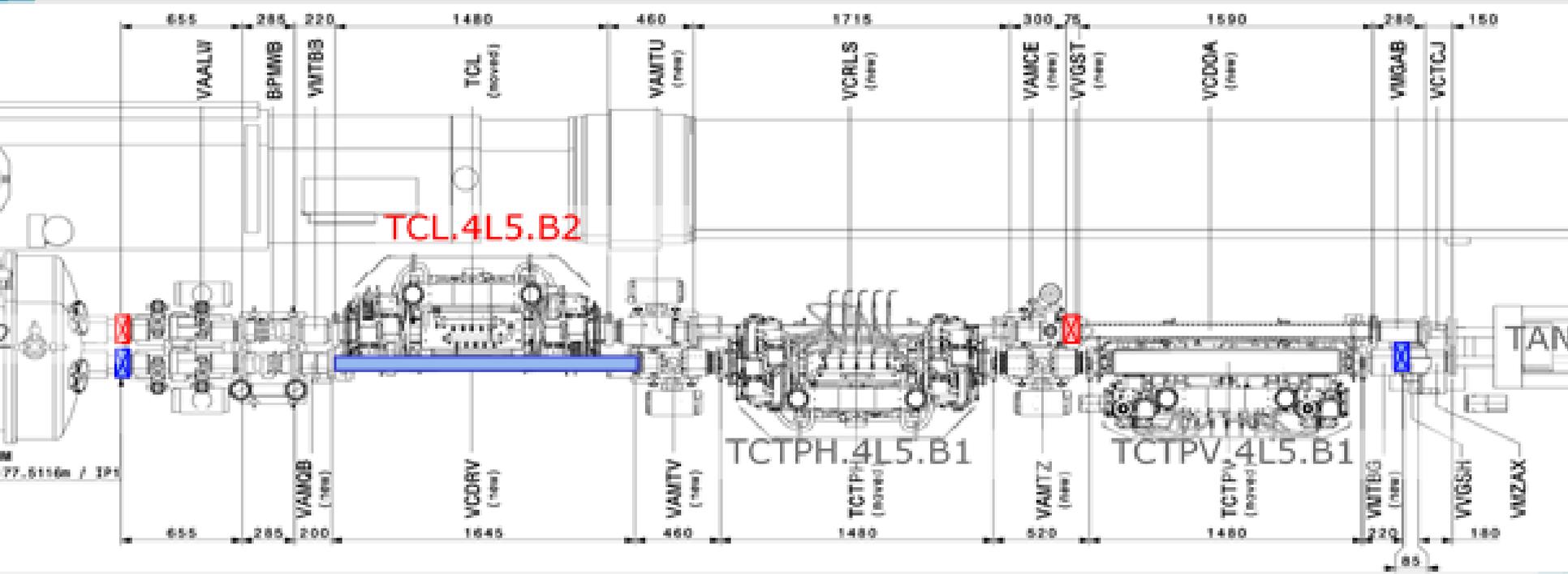
## To remove the wire collimator in slot TCLVW.A5L1.B2

1. Venting of the A5L1.R vacuum sector between Q4 and Q5, left of IP1.
2. Remove TCTW collimator from slot TCLVW.A5L1.B2 and temporary storage (tunnel?) for later transport to slot TCTPV.4L1.B1. **Note that the flexible cables connected to the wires will have to be disconnected both on the collimator and the junction box sides before any intervention.**
3. Replace with a chamber type are VCDSS (ID80, L=1.48m, 2 QCF100 flanges) – DB.
4. Alignment of the new chamber, pump-down and bake-out of the A5L1.R vacuum sector.
5. Closing the cooling water tapping (see section 2.2.3.3 in ECR).
6. New cabling (see sections 2.2.3.4 in ECR).

## To replace the TCTPV.4L1.B1

1. Venting of sector 4L1.B.
2. Removal of TCT collimator from slot TCTPV.4L1.B1 (protection of the QRL may be required) and transport to permanent storage.
3. **Change lifting plates of wire-in-jaw collimator (prepared to avoid interference with the support of the chamber on B2).**
4. Installation of the TCTW coming from slot TCLVW.A5L1.B2 into slot TCTPV.4L1.B1.
5. Alignment of the collimator.
6. Pump-down of the 4L1.B sector and bake-out.
7. Reconnection of all cables and wires.
8. **Full collimator re-commissioning (including the 5th axis, and water-cooling with wires ON).**

# Moving of the TCTW collimator from slot TCL.4L5.B2 to slot TCTPH.4L5.B1



# Moving of the TCTW collimator from slot TCL.4L5.B2 to slot TCTPH.4L5.B1

- The TCTW collimator currently installed in slot TCL.4L5.B2 shall go to slot TCTPH.4L5.B1 and viceversa
  - the orientation of the TCTW collimator will be flipped longitudinally to fit in the slots.
- This installation will require venting of both B1 and B2 lines between the TAN and D2, left of IP5, alignment and bake-out after installation.
- Since both slots are equipped for the same type of collimators, with cabling for pick-ups, and the junction box used for the wires in TCL.4L5.B2 sits close to the new slot TCTPH.4L5.B1, no cabling re-routing will be necessary, only disconnecting and reconnecting for the installation.

# Moving of the TCTW collimator from slot TCL.4L5.B2 to slot TCTPH.4L5.B1 and installation of a space TCL type (copper) collimator in slot TCL.4L5.B2

1. Vent of the 4L5.R and 4L5.B vacuum sectors between, left of IP5.
2. Remove first the wire collimator from slot TCL.4L5.B2 and store the collimator in tunnel bunker. **Note that the flexible cables connected to the wires will have to be disconnected both on the collimator and the junction box sides before any intervention.**
3. Remove the VAMQB (holding the roughing valve) and VCDRV chamber on B1 (TE-VSC not exposed to TCL.4L5.B2) (Step to be avoided if possible).
4. Remove the TCT collimator in slot TCTPH.4L5.B1 and send to permanent storage.
5. **Bring a TCL copper collimator or use TCT to be installed in slot TCL.4L5.B2, align B2 line with the help of the survey, close and pump down (cooling to be checked).**
6. Re-install VCDRV chamber on B1, if step 3 done
7. **Change lifting plates of wire-in-jaw collimator (prepared to avoid interference with the support of the VCDOA chamber on B2)**
8. Install collimator in slot TCTPH.4L5.B1.
9. Align, close and pump-down B1, bake-out.
10. Reconnect of all cables and wires.
11. Full collimator re-commissioning (including the 5th axis, and water-cooling with wires ON for the TCTW).