PREX2/CREX Target Chamber

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PREX2/CREX ERR

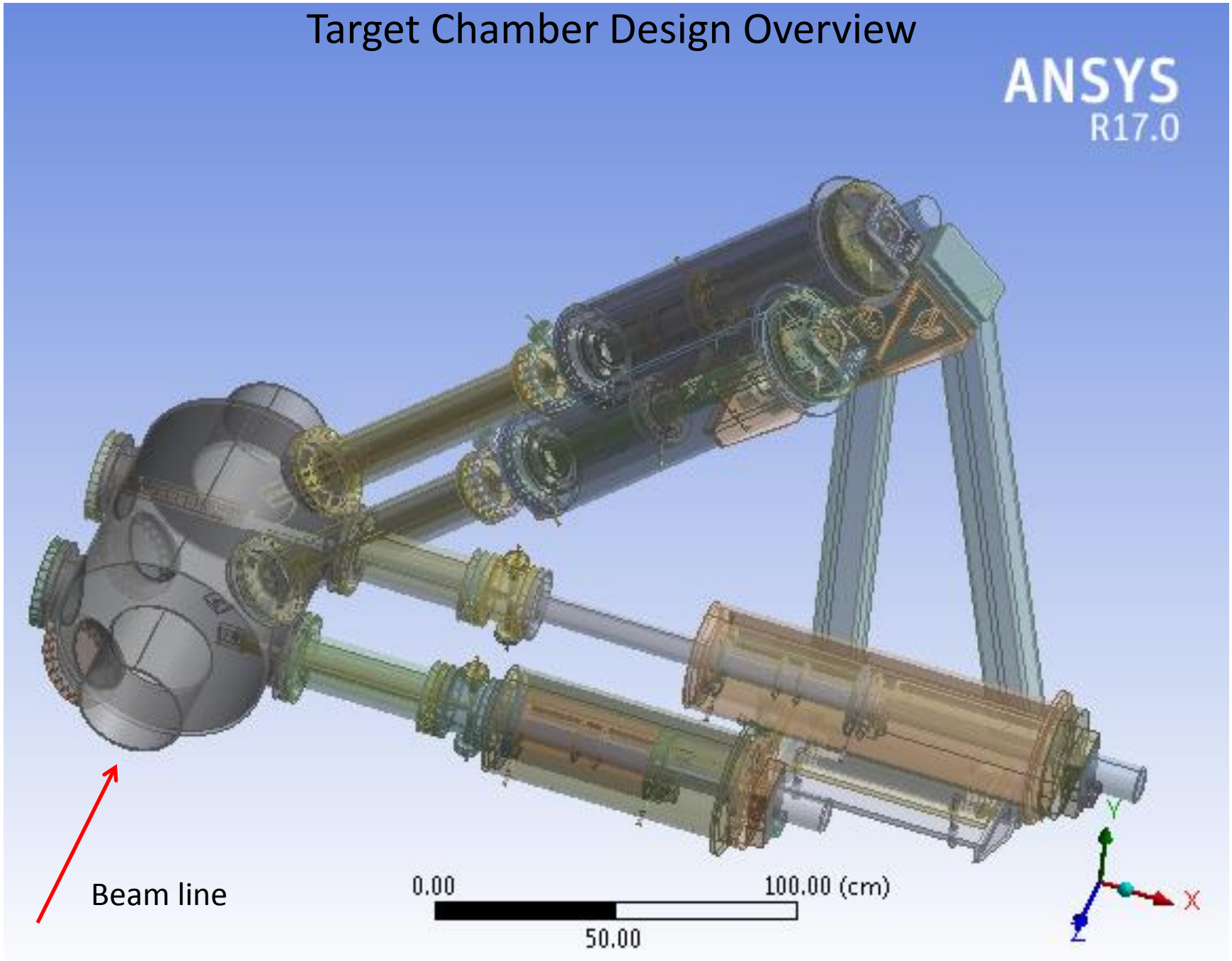
Target Chamber Design Overview

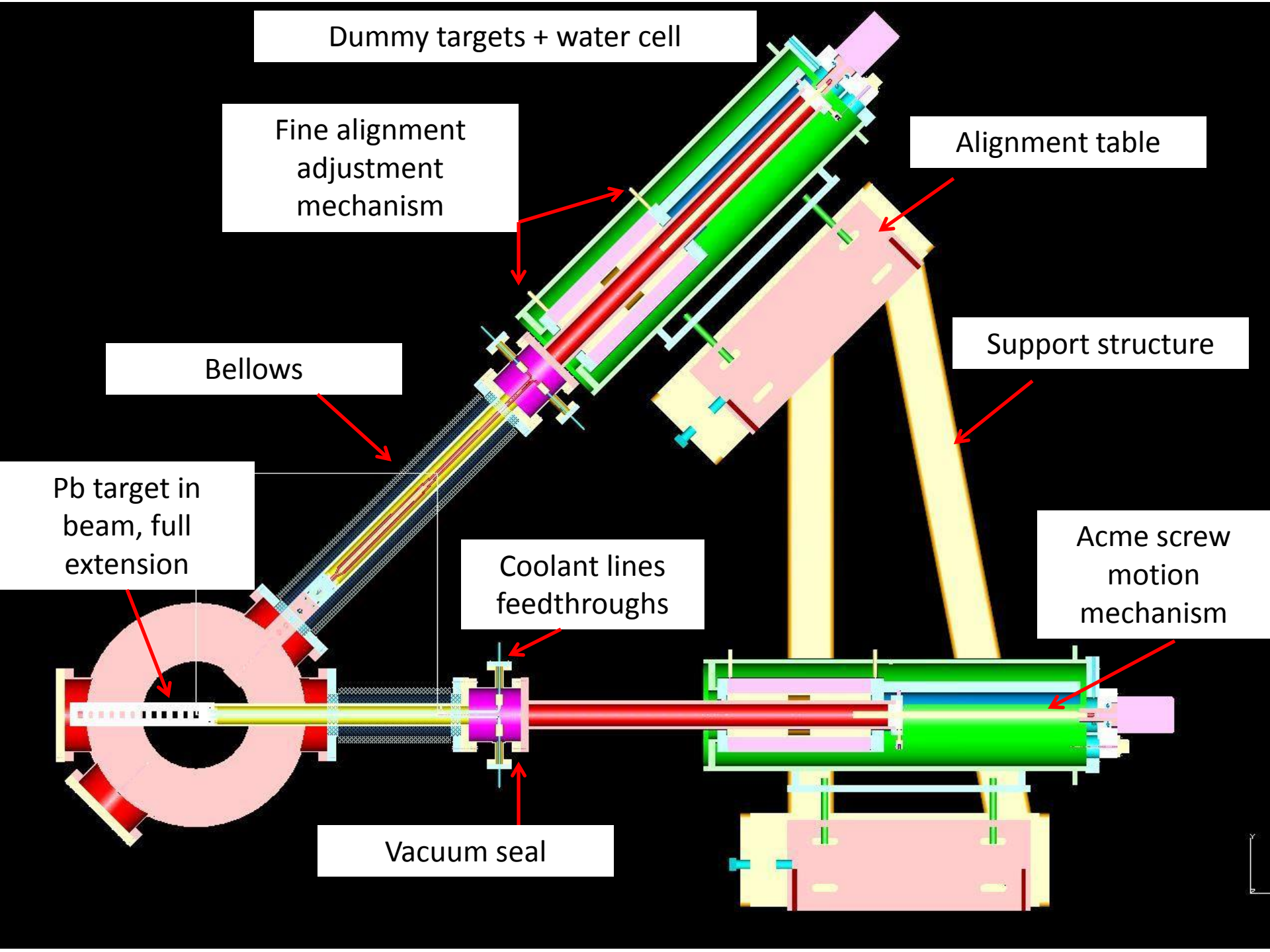
- The target chamber will be Al made with 0.25” walls, 60 cm diameter (2’) and 72 cm long along the beam line
- There are 4 independent linear motion mechanisms on bellows serving respectively prex2 (one for Pb targets and one for dummies + water cell) and crex (one for 48Ca and one for dummies + water cell)
- All motion mechanisms are outside vacuum and serviceable without breaking vacuum
- The Pb and Ca ladders are cryogenic with rigid piping in vacuum and flexlines outside it, the dummies are water cooled
- The ladder for Pb will mimic the prex1 ladder, but with 12 wafers mounted, 10 high purity Pb, 2 with regular Pb for tests

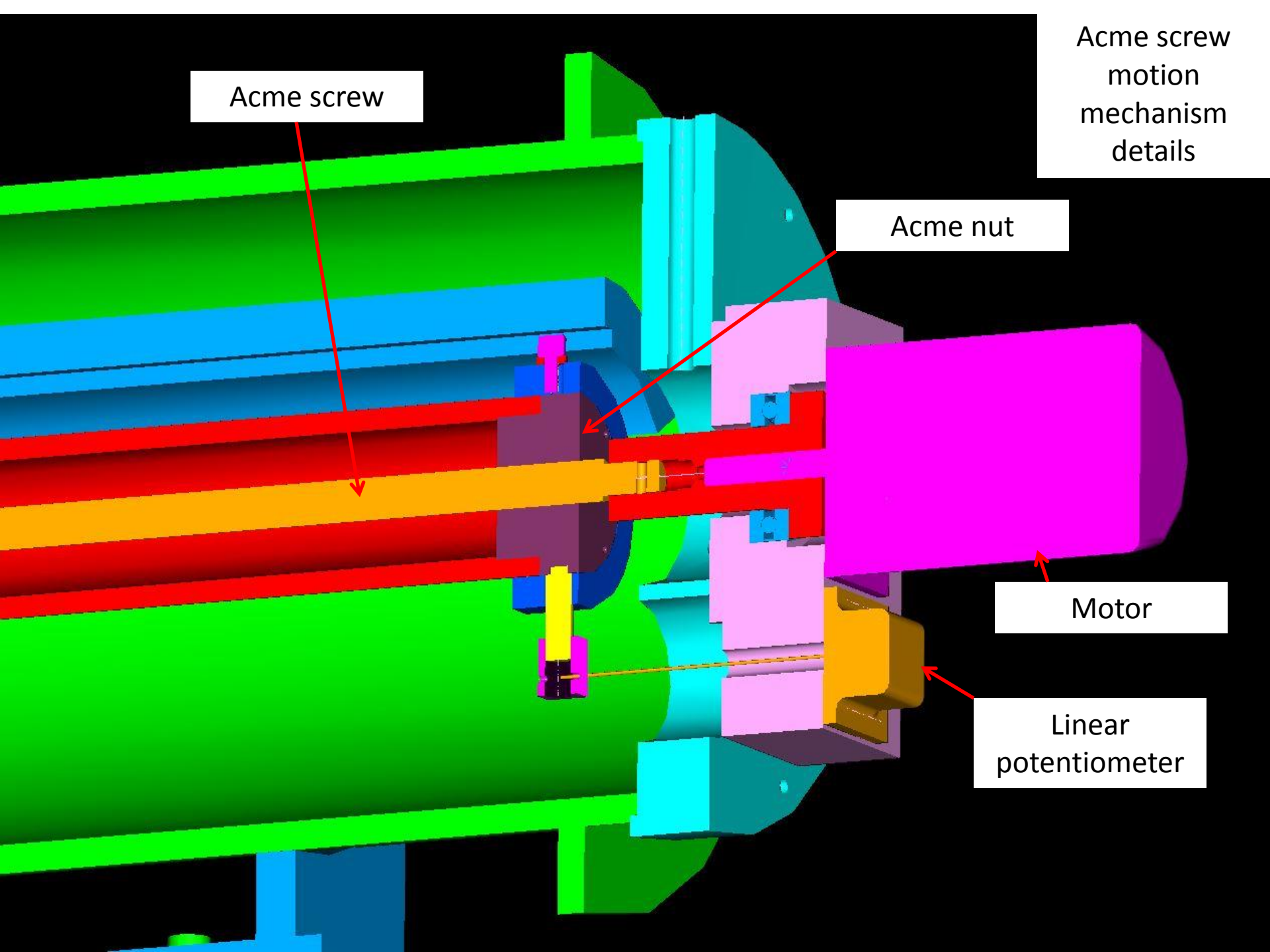
Target Chamber Design

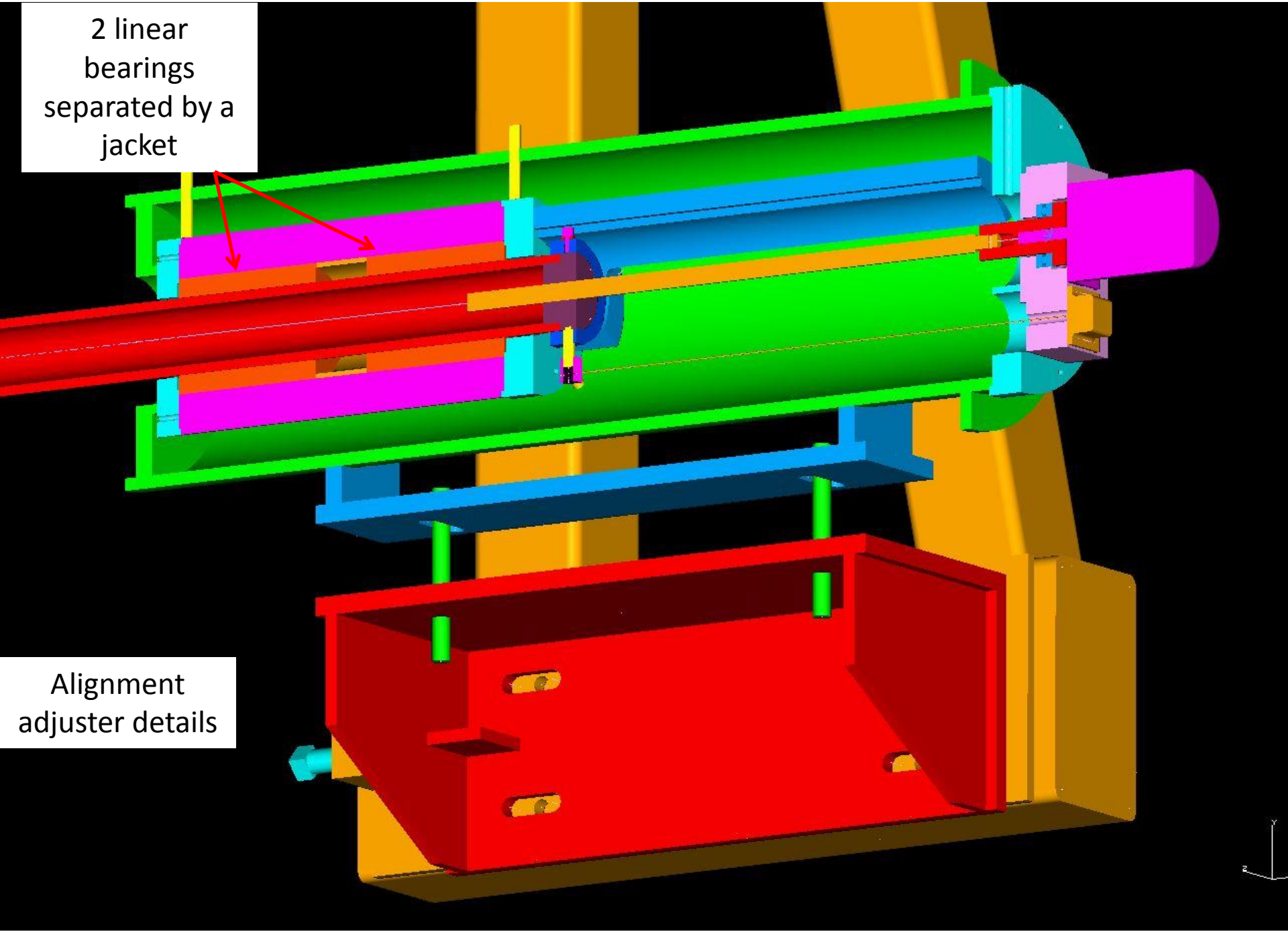
- All vacuum seals are conflat or metal O-rings
- The target group has a plan to accommodate the motion of coolant lines outside of vacuum
- The Pb target is low power at less than 100 W and the Ca target is high power (may need as much as 400 W, depending on beam current)
- 2-stage alignment adjusters could position a target on the beam to less than 1 mm from ideal position
- There is a target working group that worked and will work on the design: Bob Michaels, Kent Paschke, Alan Gavalya, Dave Meekins, Chris Keith, Wayne Sachleben (did all the design work), Silviu Covrig Dusa
- The target chamber will be built and installed by the target group with help from the collaboration, the DA for this system is Dave Meekins
- Commissioning and operations is the responsibility of the collaboration

Target Chamber Design Overview




Dummy targets + water cell
Fine alignment adjustment mechanism
Alignment table
Bellows
Support structure
Pb target in beam, full extension
Coolant lines feedthroughs
Acme screw motion mechanism
Vacuum seal


Acme screw
Acme screw motion mechanism details
Acme nut
Motor
Linear potentiometer


2 linear bearings separated by a jacket
Alignment adjuster details