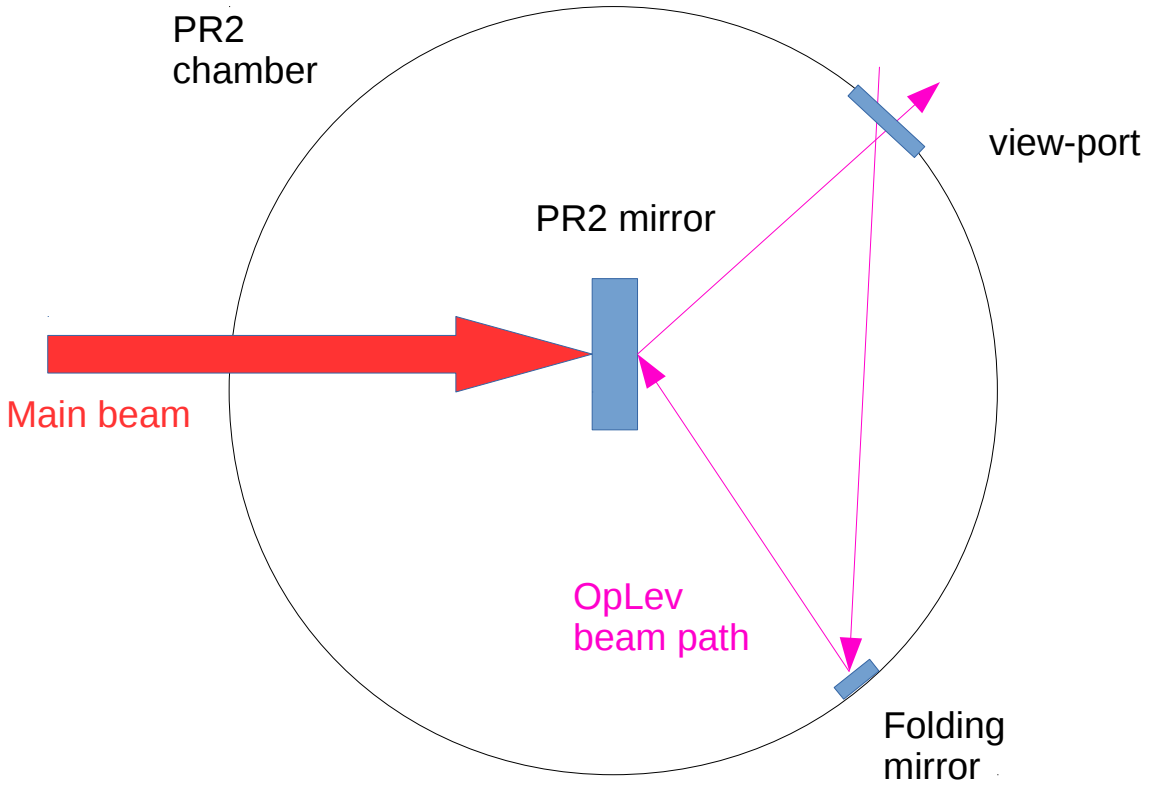
Report on PR2-OpLev Feasibility Test

Simon Zeidler on May 18/19

Concept of PR2-OpLev

- Main issue: only one view-port is available!
- For the OpLev it means that input and output beam have to use the same view-port
- Possible solution: using a folding-mirror inside the PR2-chamber to focus the beam onto the PR2 mirror
- This folding-mirror is located vis a vis the view-port and should „see“ both the viewport and the AR side of the PR2-mirror

Sketch of PR2-OpLev Concept



Test Results

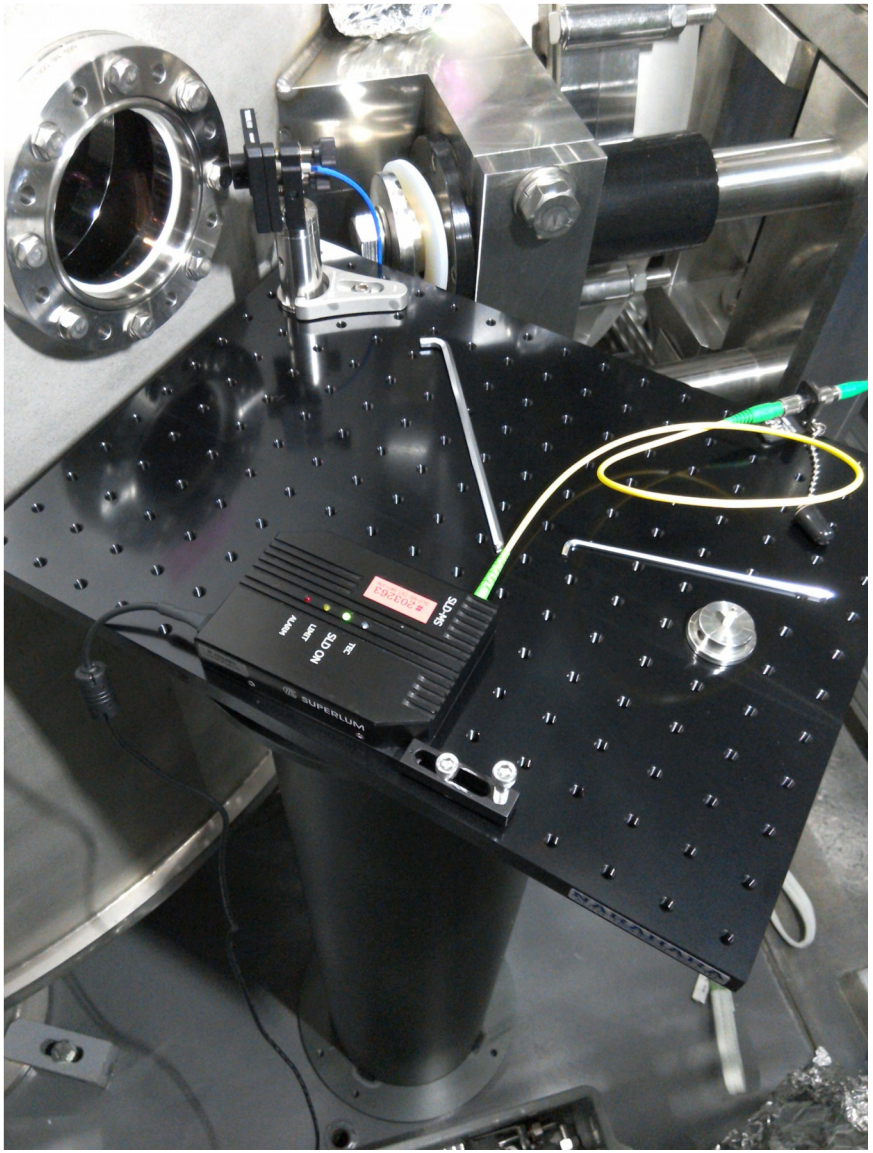
- We (Akutsu-san and I) installed the island and the folding-mirror (one inch) successfully inside the chamber on May 18th
- Since no PR2 mirror is prepared yet, we set up another one-inch mirror fixed to the optical table inside the chamber as a substitute
- On May 19th, I set up the OpLev collimator and tried to focus the beam on the folding-mirror

- After that I, I focussed the beam on the PR2 substitute and looked for an out-going beam on the view-port
- After some small adjustments on the alignment of the collimator, I found the out-going beam
- Basic conclusion: the concept works for PR2!

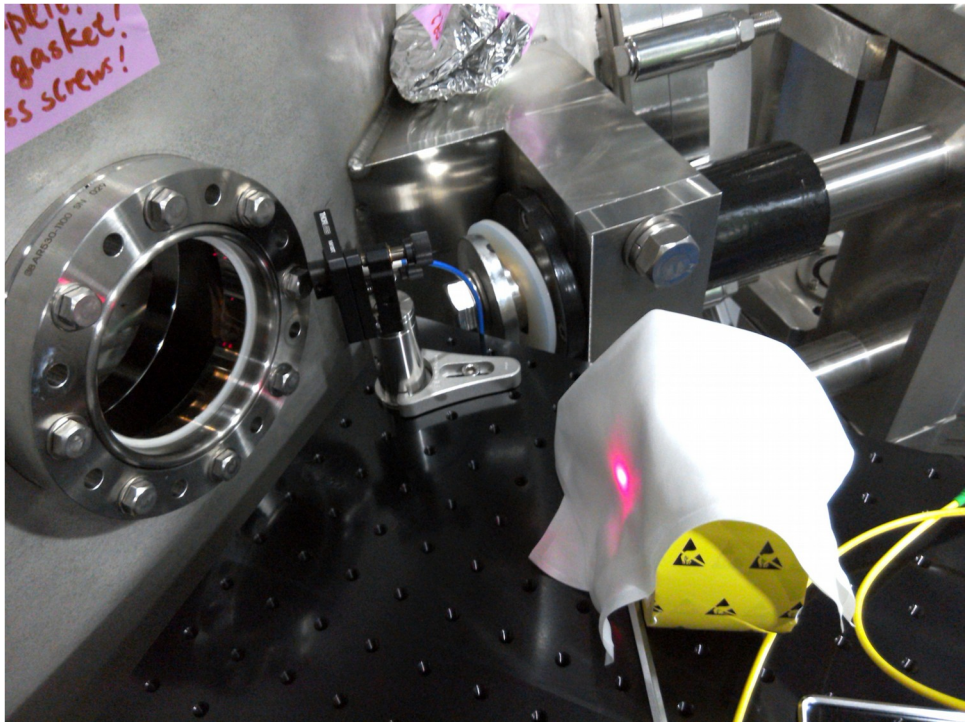
Things to keep in mind (issues)

- In the test the beam height was not fully adjusted (needs to be done in the real configuration)
- Due to a wide angle of incidence of the input beam onto the view-port, there is a more intense ghost beam
- The additional folding-mirror is coupling additional vibration noise to the OpLev beam (measurement?)
- The actual PR2 mirror will be slightly obliged at the AR side which was not the case for the substitute mirror
  → feasibility to be proofed yet

Pictures

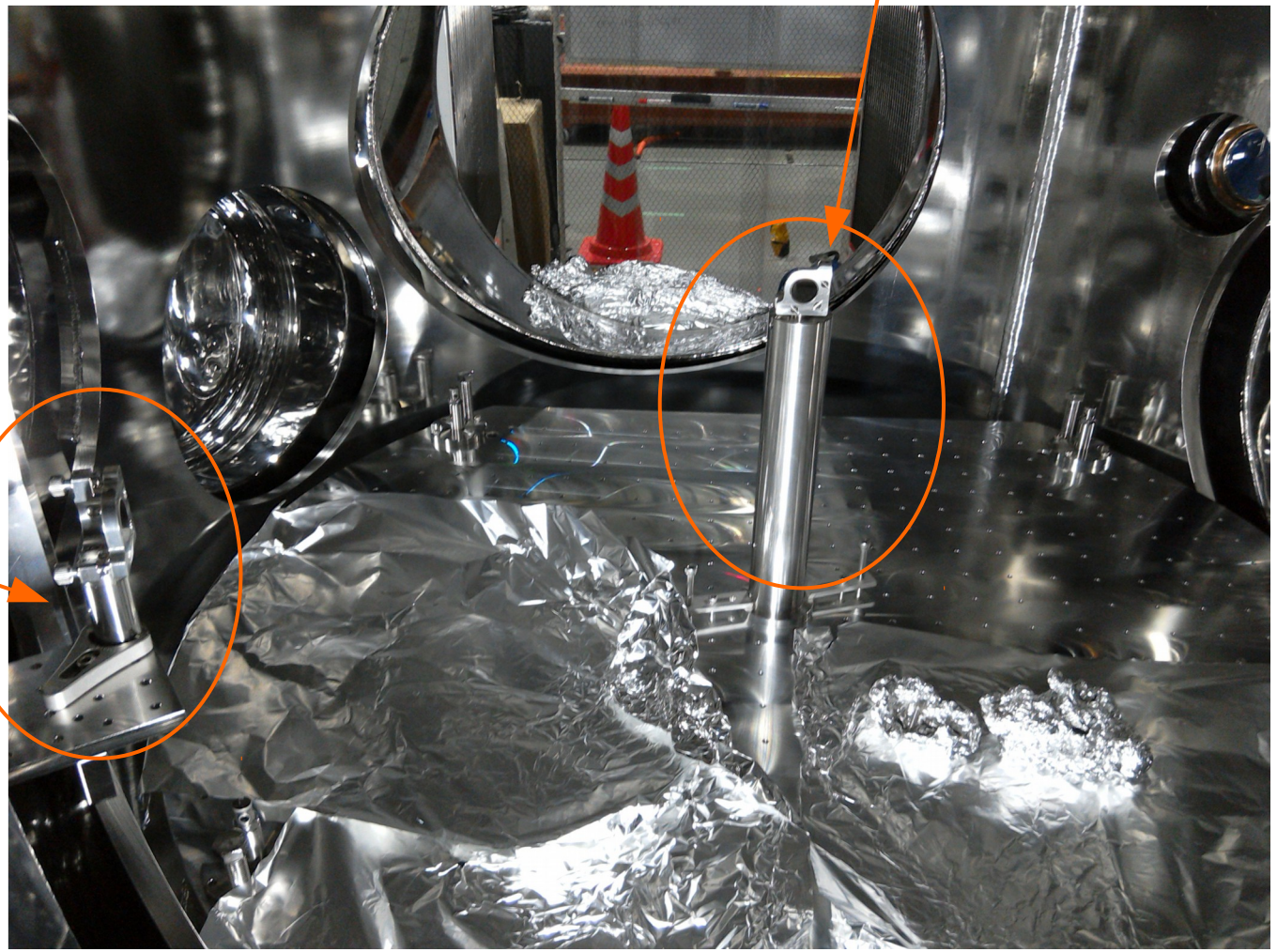


OpLev table with collimator



OpLev beam leaves chamber from the input view-port

Substitute mirror



Island with folding-mirror