dRICh first tentative porting of the geometry into ECCE

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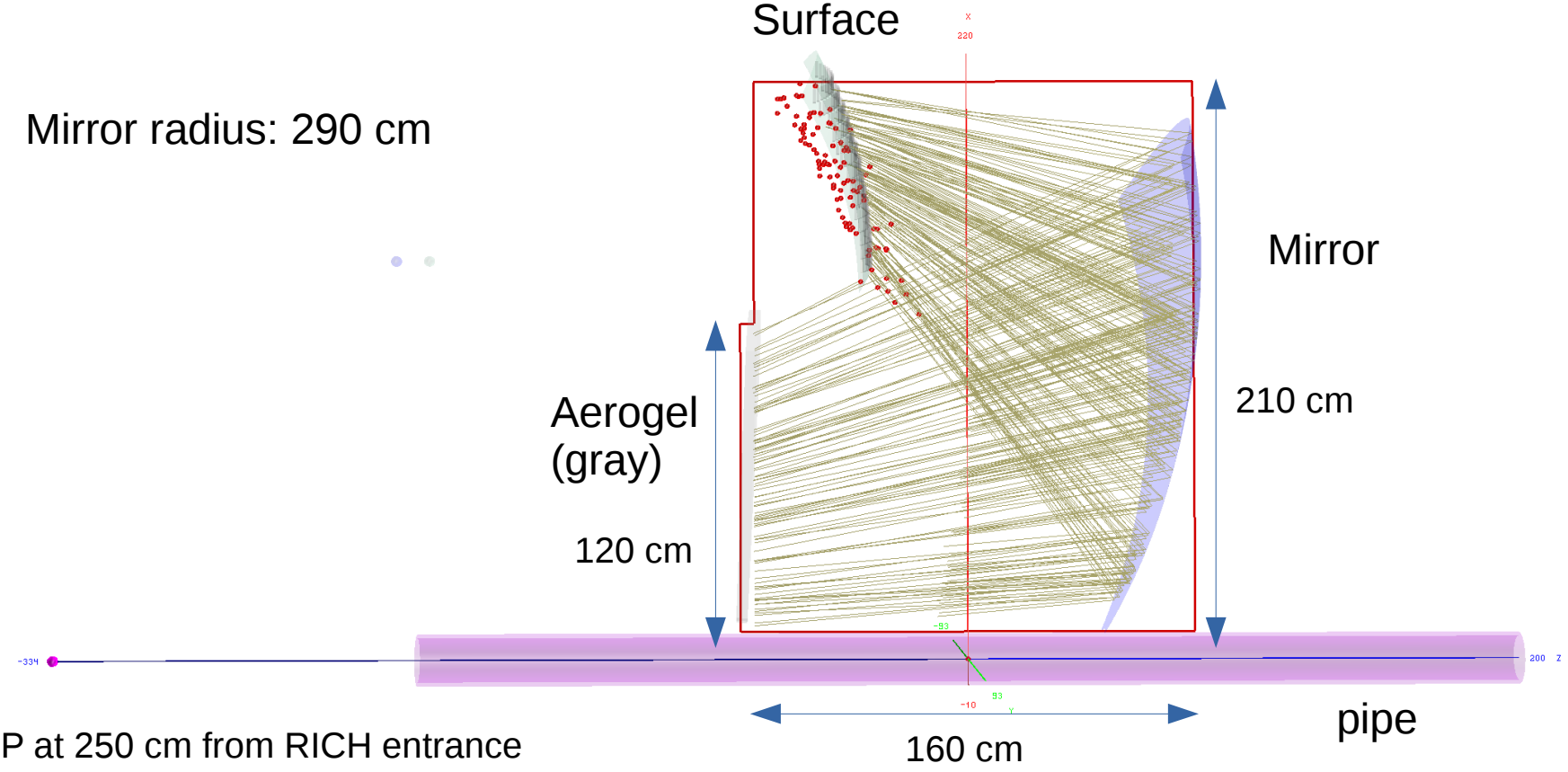
and the EIC-eRD14/PID Consortium

Original JLEIC dRICh (single sector)

red dots: focal region (approx.)
yellow lines: photons at gas Cherenkov angles relative to charger particles direction from IP

red line: JLEIC dRICh vessel profile

Mirror radius: 290 cm



IP at 250 cm from RICH entrance

One of the first attempt to fit dRICh into ECCE constraints (single sector)

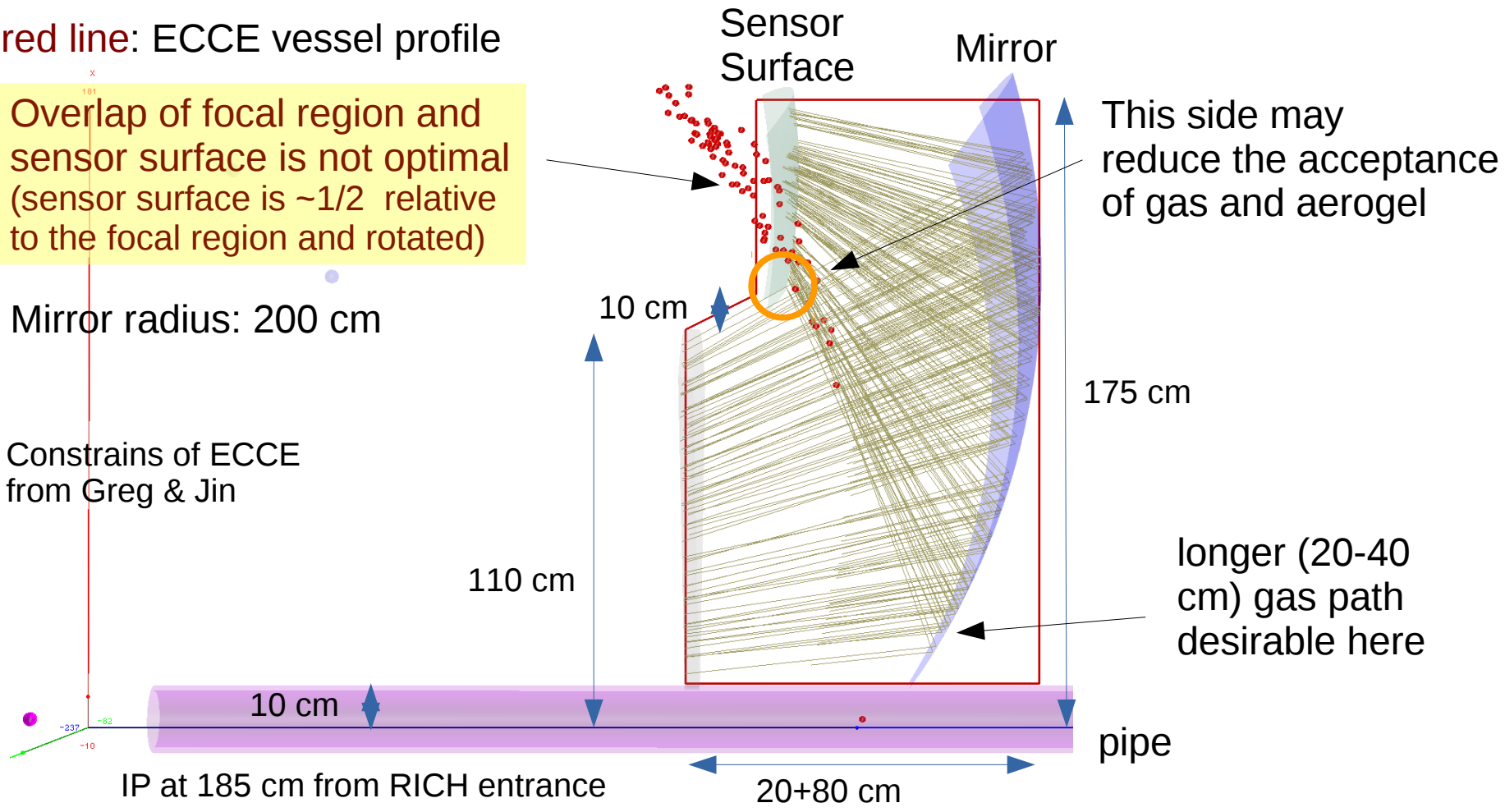
red dots: focal region (approx.)
yellow lines: photons at **gas Cherenkov** angles relative to charger particles direction from IP

red line: ECCE vessel profile

Overlap of focal region and sensor surface is not optimal
(sensor surface is ~1/2 relative to the focal region and rotated)

Mirror radius: 200 cm

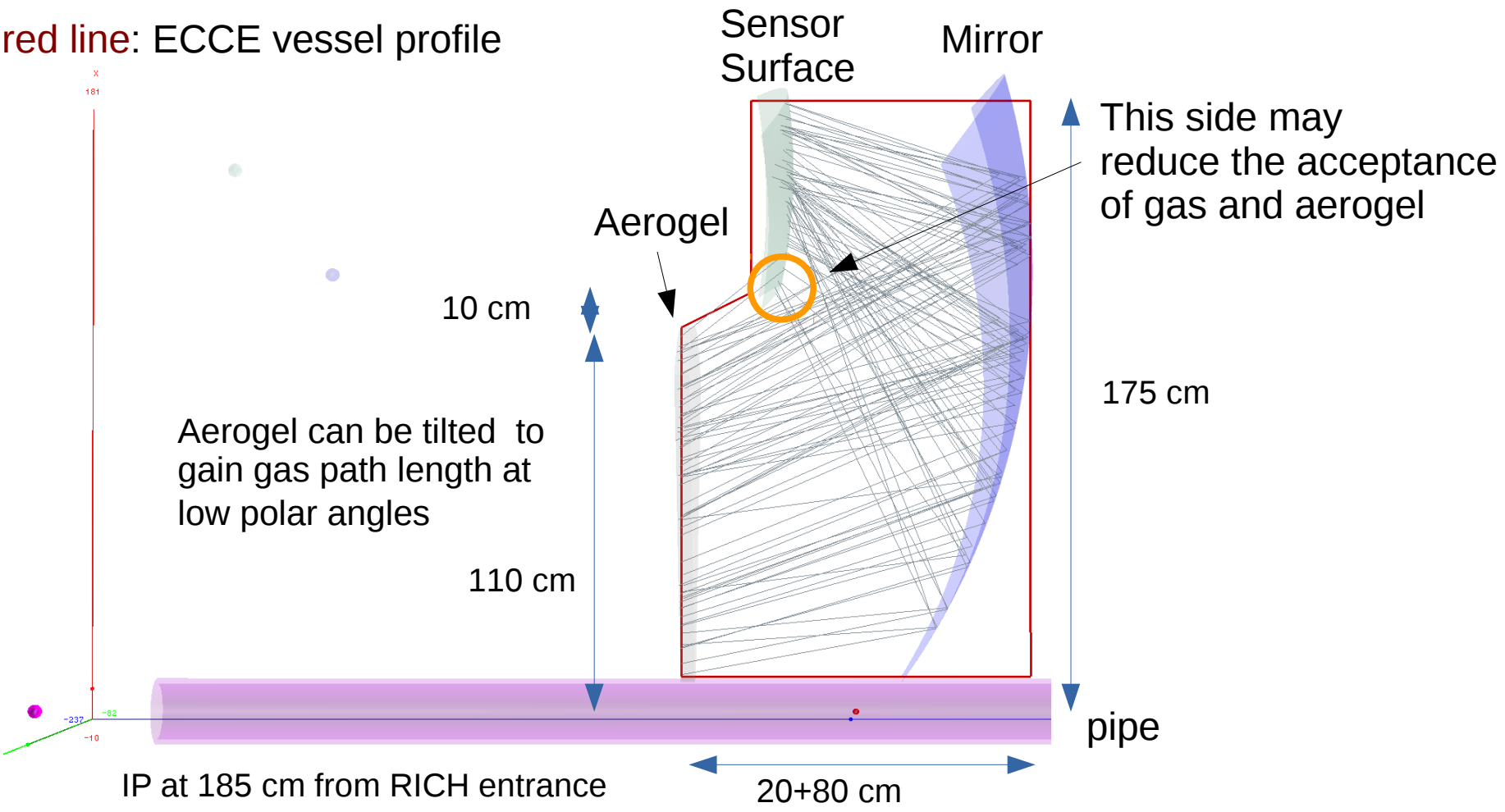
Constrains of ECCE from Greg & Jin



One of the first attempt to fit dRICh into ECCE constraints (single sector)

red dots: focal region (approx.)
gray lines: photon at **aerogel Cherenkov** angles relative to charger particles direction from IP

red line: ECCE vessel profile



Few preliminary comments

To improve matching of focal region and sensor surface we should move:
- the upper red points toward the sensor, closer to the mirror
- the lower points up, toward the sensor and somehow far from the mirror

As done in HERMES, LHCb and CLAS12, mirror will likely be a matrix of smaller mirrors
→ we shall consider the possibility to have decreasing radius of the mirrors on the matrix going from the bottom to the top; this comes with potential side effects that need to be evaluated (shadowing, variable chromaticity ...)

Additional transverse (and longitudinal) space would help simplifying the design and get better performances – the current constrains cannot probably guarantee the baseline performances