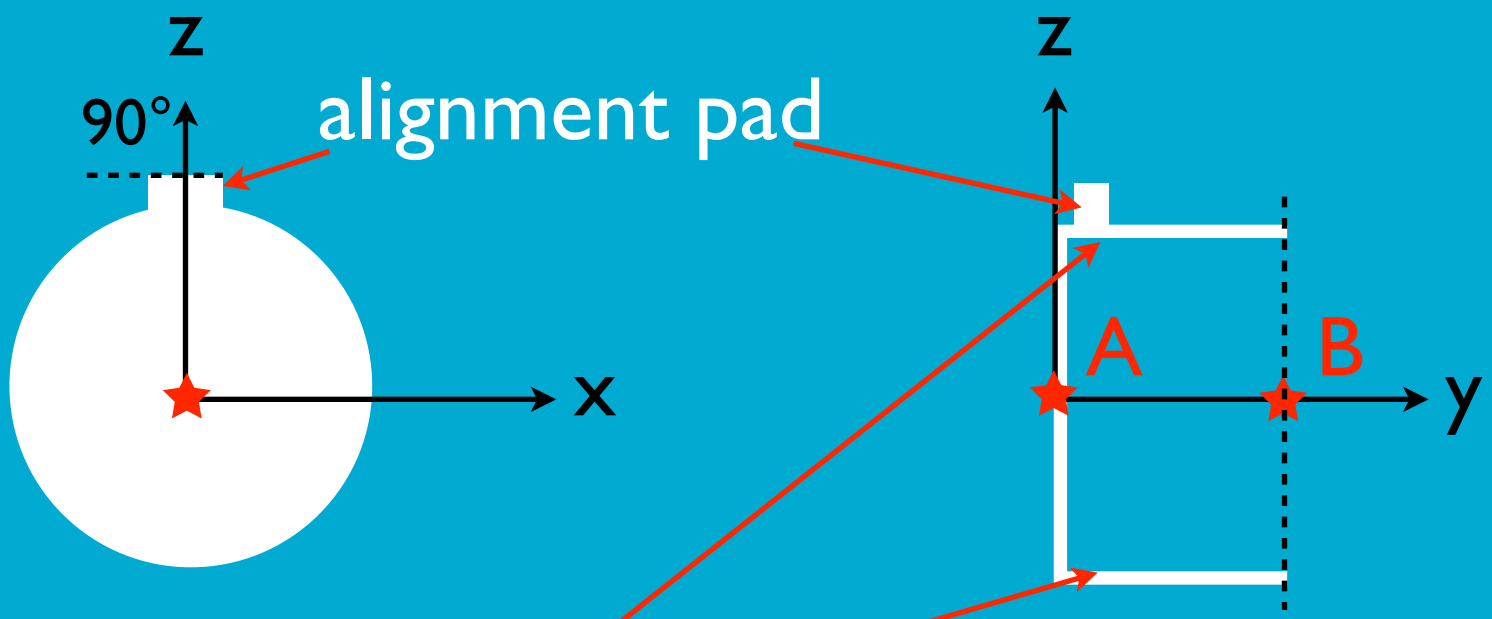
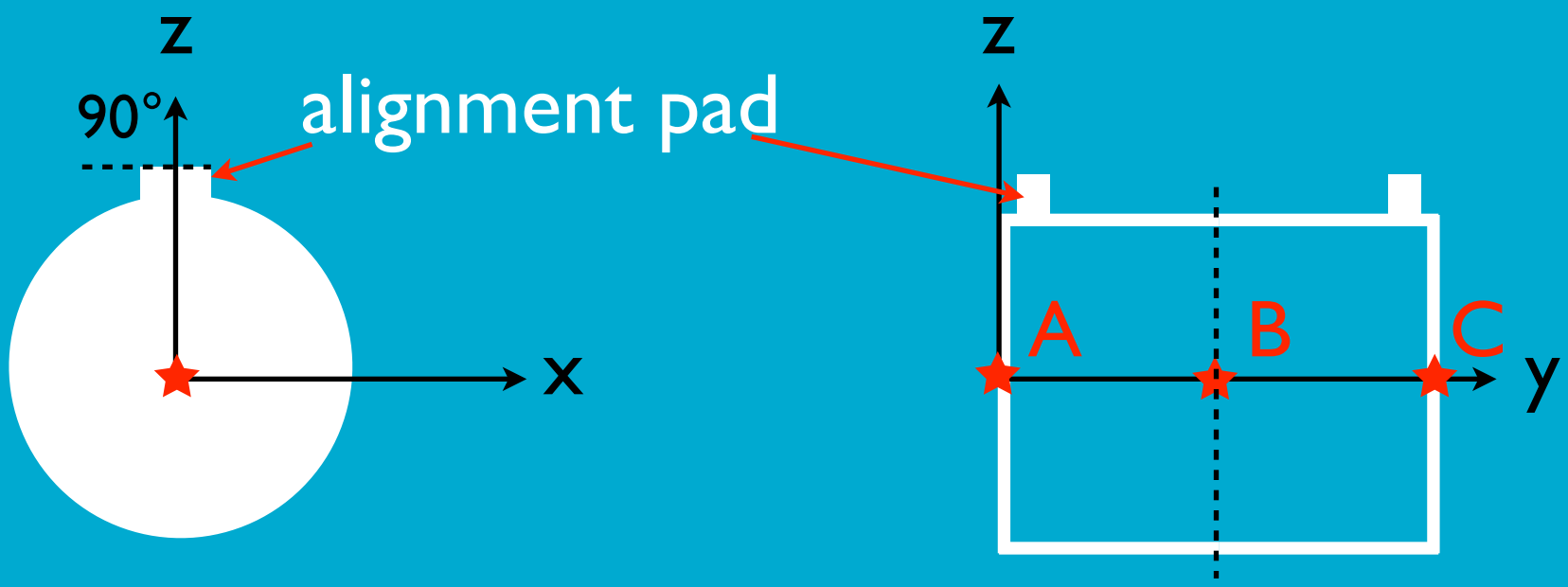
coordinate system for all 1/2 cavities



positions of points A (origin) and B are determined by inner diameters

coordinate system for full cavities



for full cavities the origin is at the upstream end

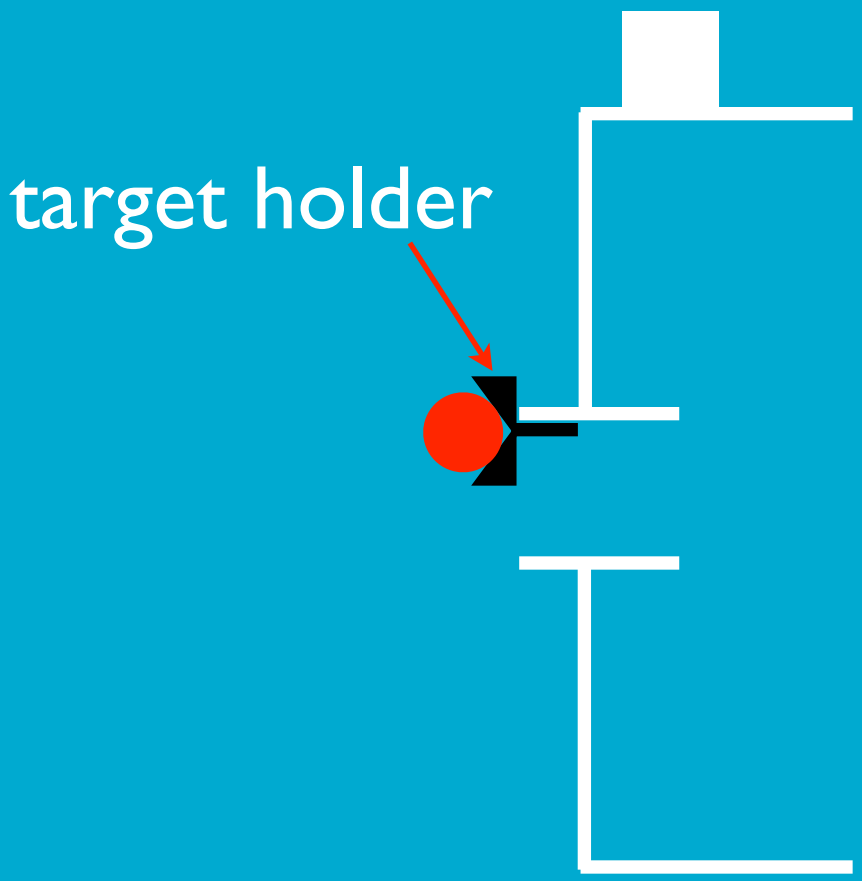
metrology data 1/2 cavity

- the origin of the reference frame is the centre of the cavity (beam pipe opening), at the outer surface of the beam pipe opening;
- the centre of 1/2 cavity at open end (point B - this point lies on the Y-axis);
- position and orientation of drift tube for the 1/2 cavity (survey reference points (at centre of 1/2" sphere), drift tube nose points);
- the positions of the survey points on the alignment pad.

metrology data full cavity

- all the points on both half cavities (in this reference frame, point C lies on the Y-axis);
- the angle between the second alignment pad and the X-axis (or the first alignment pad).

measurements on full cavities



- we need to be able to measure the centre of the cavity (beam pipe opening) from the outside (to establish the origin and the point C);
- by moving the target around the inner surface of the beam pipe we get the centre of the beam pipe on each side;
- the outer surface (parallel to XZ plane) should be well defined, perpendicular to the 1/2 cavity axis;
- the alignment pad survey points and tilt reference enable us to re-establish the 1/2 cavity reference frame;
- we must be able to determine the position of the drift tubes.