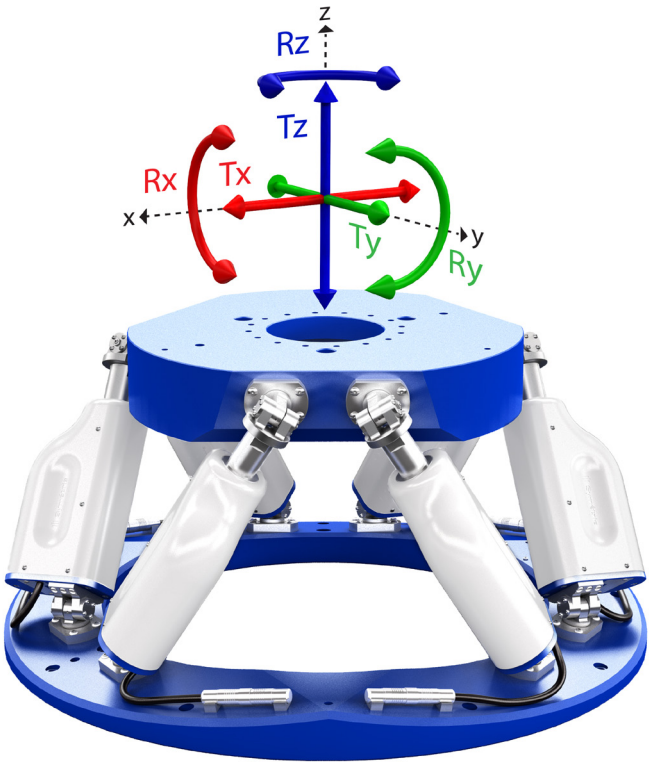
Hexapod technology

Symétrie

6 Degrees Of Freedom

A hexapod is a parallel kinematic structure composed of a mobile platform linked to a fixed platform with 6 actuators.

This design allows to move an object placed on the mobile platform with 6 DOF (Degrees Of Freedom). In other words, the hexapod can move an object along the 3 translations (Tx, Ty, Tz) and the 3 rotations (Rx, Ry, Rz); any combination is possible.



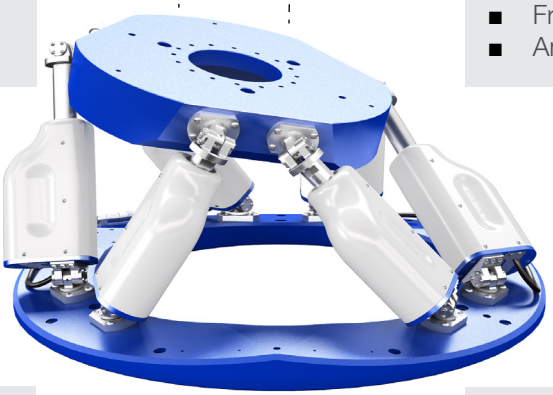
A scalable solution

Environment

- Vacuum (down to 10^{-9} mbar)
- Clean room

Payload

- From few grams to several tons
- Any orientation available



Performances

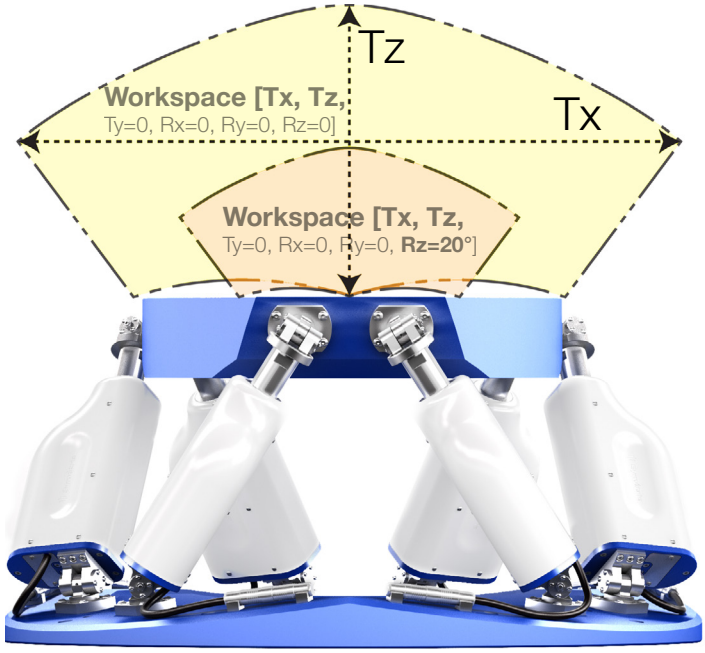
- Resolution
- Repeatability
- Accuracy
- Stiffness
- Stability
- Speed

Workspace

- From few µm to several hundred mm
- From few µrad to 45°

Workspace

A workspace defines all reachable positions of the mobile platform for specified degrees of freedom. An infinity of workspaces exists depending on which DOF are set to be swept and which DOF are set to be constant among Tx, Ty, Tz, Rx, Ry, Rz.



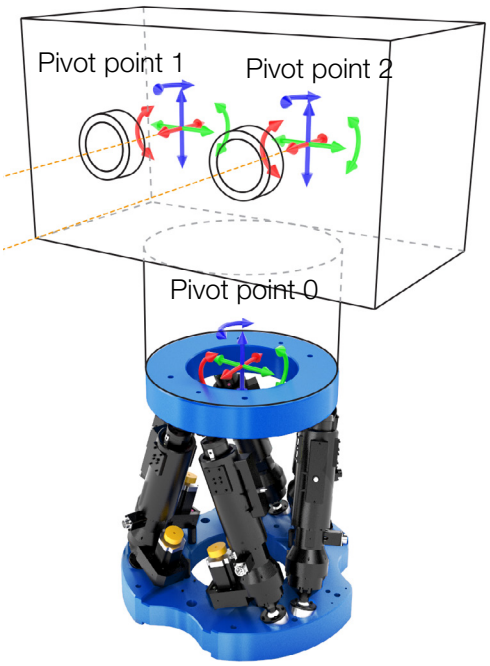
Example of two workspaces:

*- In yellow, the workspace [***Tx=swept***, ***Tz=swept***, Ty=0, Rx=0, Ry=0, Rz=0].*
*- In orange, the workspace [***Tx=swept***, ***Tz=swept***, Ty=0, Rx=0, Ry=0, **Rz=20°**].*

The orange workspace is smaller than the yellow workspace because the Rz rotation requires extra actuators' length.

Configurable pivot point

In order to orientate the mobile platform in the desired way, a 3D rotation center has to be defined. This point is not limited to the center of the mobile platform and can be placed wherever the user needs it to be.



Hexapod designed and built for MAX IV Laboratory synchrotron. Special rotation centers have been defined to adjust easily a polarimeter with respect to the beam position.

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