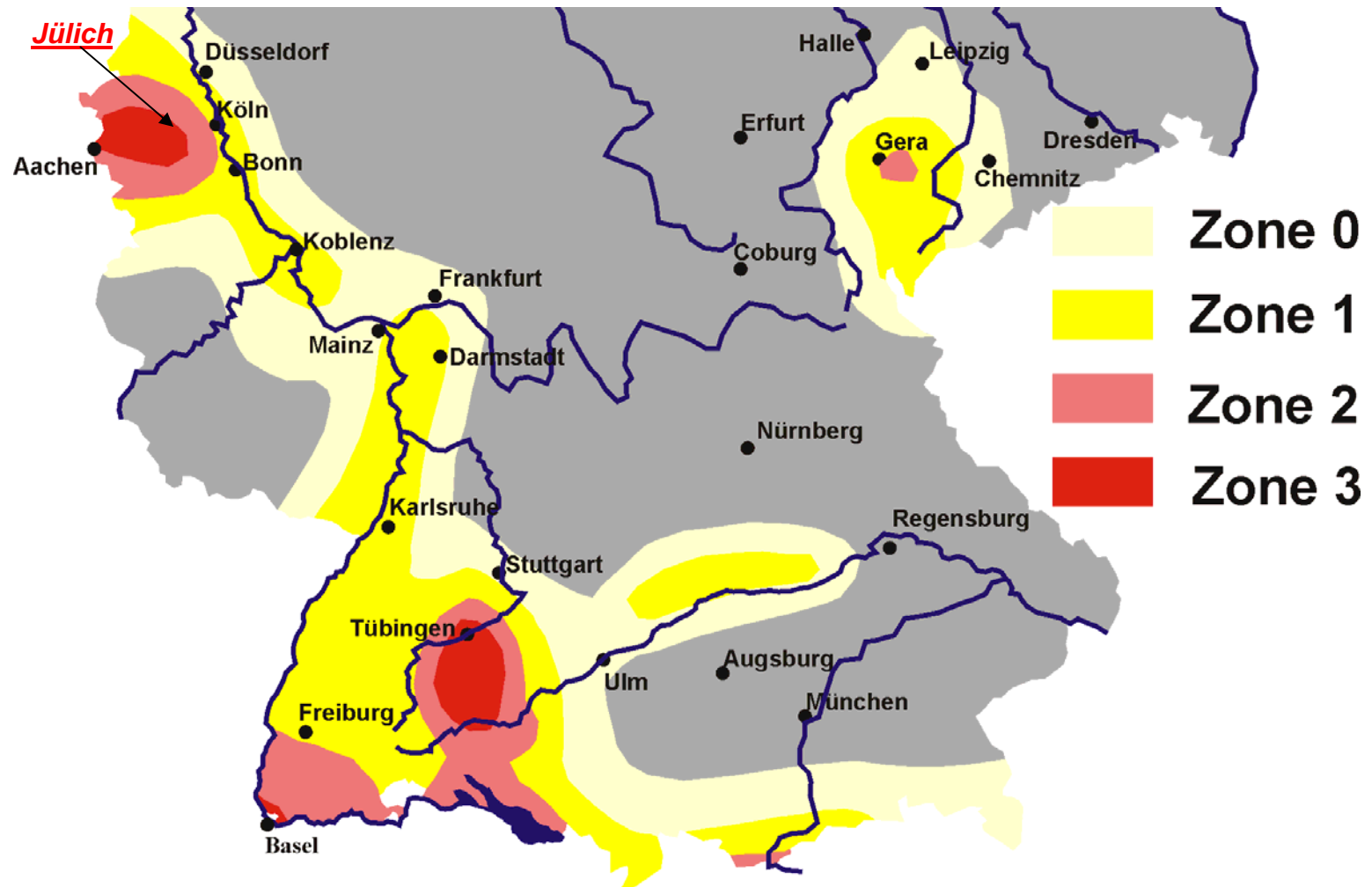


Some Updates on Cryostat-Yoke Interface

J.Lühning, 2011-Sep-01

- Forces at yoke-cryostat interface
- Positions of cryostat-yoke supports

Seismic zones in southern Germany



Maximum forces expected at cryostat-yoke interface

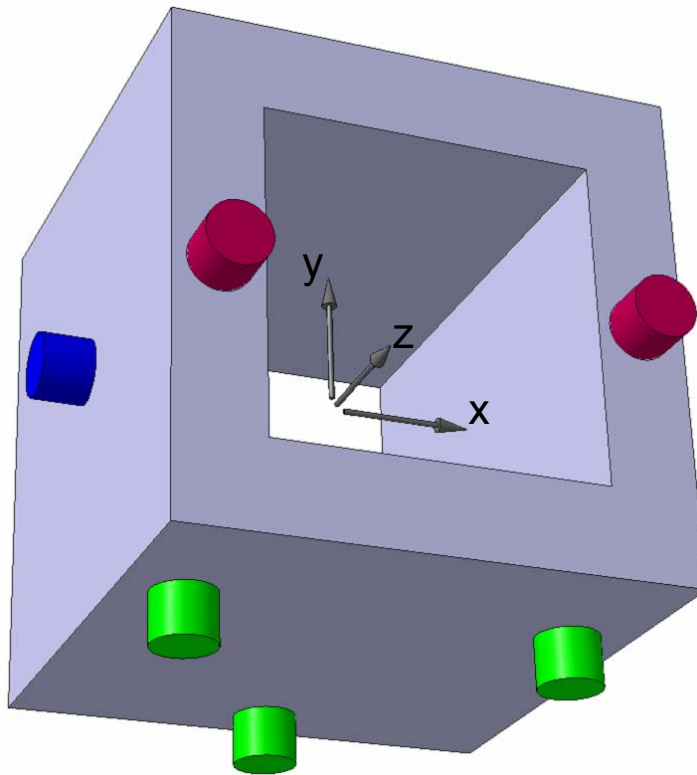
	F_x / kN	F_y / kN	F_z / kN	z_g / mm
Weight of coil and cryostat	-	-140 (?)	-	355
Weight of inner detectors	-	-220	-	220
Magnetic force in nominal position at maximum current	-	-	-40	-
Magnetic forces due to tolerable misalignment	± 45	± 45	± 100	355
Horizontal seismic forces	± 54	-	± 54	264

Abundant misalignment assumed for coil w.r.t. yoke: $\Delta z = \pm 20\text{mm}$, $\Delta x = \Delta y = \pm 15\text{mm}$

Influence of angular misalignment about x-axis and y-axis neglected (rather small, moment in the order of 10kNm / mrad)

Seismic forces calculated for horizontal acceleration of 1.5 m/s² (Jülich), vertical acceleration can be neglected

Number of supports required for fixing 3-dimensional object



For a 3-D object there are 6 degrees of freedom in the Cartesian coordinate system: displacements dx , dy , dz and rotations rx , ry , rz .

When using 1-dimensional supports, at least 6 of them have to be provided (statically determinate case).

In the figure to the left, for example, there are 3 green supports which suppress dy , rx , and rz . The red supports suppress dz and ry , and the blue one suppresses only dx .

Proposal for positions of PANDA cryostat-yoke supports

