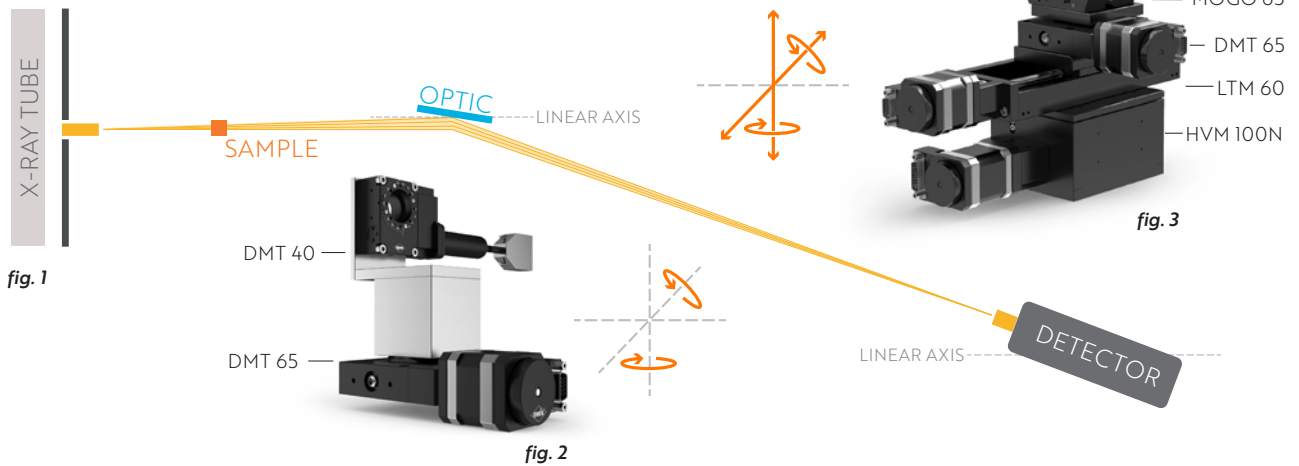


OWIS positioning systems: setup for the determination of atomic distances

At the TU Berlin, Prof. Dr. Birgit Kanngiesser's "Analytical X-ray Physics" group succeeded in developing a method that efficiently uses the light of an X-ray tube and directs it to a detector with little loss of brilliance. This allows measurements for the determination of atomic distances to be carried out even in smaller laboratories. OWIS positioning systems simplify the handling decisively.



Atomic distances were often determined using EXAFS spectroscopy (Extended X-ray Absorption Fine Structure) and using a synchrotron. The size of the synchrotron radiation generator is problematic here, because the rings of the particle accelerator can only be set up in very large halls and operated by experts. The measurement itself requires the high brilliance, but only a small fraction of the synchrotron light. The schematic diagram (fig. 1) shows the setup of the X-ray spectroscopy method developed at the TU Berlin.

For a cooperation between TU Berlin and the Max-Planck Institute for Chemical Energy Conversion in Muelheim an der Ruhr, we have built two manipulators by combining several axes. Thus, the optic (fig. 2) and the detector (fig. 3) can be aligned highly precise to the beam. The distance to the light source can be adjusted via the two linear axes. The optic rotates with a positioning system of two **rotary measuring stages DMT 40 and DMT 65** in two directions of motion. The detector is moved in four degrees of freedom. For this purpose, we have combined **high-precision goniometer MOGO 65, rotary measuring stage DMT 65, precision linear stage LTM 60 and elevator stage HVM 100N**.



The X-ray spectrometer (fig. 4) has proved itself in practice. Another system for use in vacuum is being planned. For this, an optic with higher resolution is being developed and the **OWIS Vacuum product line** for high vacuum with pressures up to 10^{-6} mbar is being integrated.