

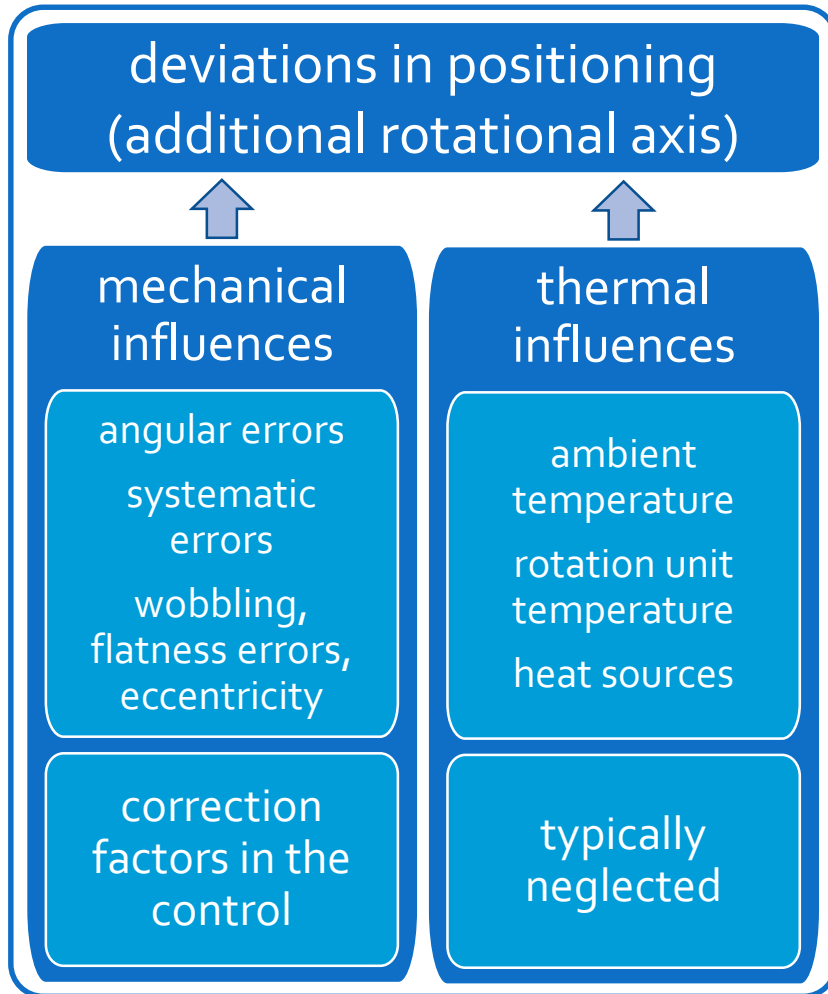
MOTION DEVIATIONS OF A ROTATIONAL POSITIONING TABLE INDUCED BY THERMAL EFFECTS

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INFLUENCES AND EXPERIMENT



Optical measurement systems:

- positioning deviation affects stitching → artefacts in merged images
- a precise and repeatable probe positioning is indispensable for the optimal focussing of the optical unit

➔ The exact positioning of the probe is a basic prerequisite to guarantee high-precision measurements

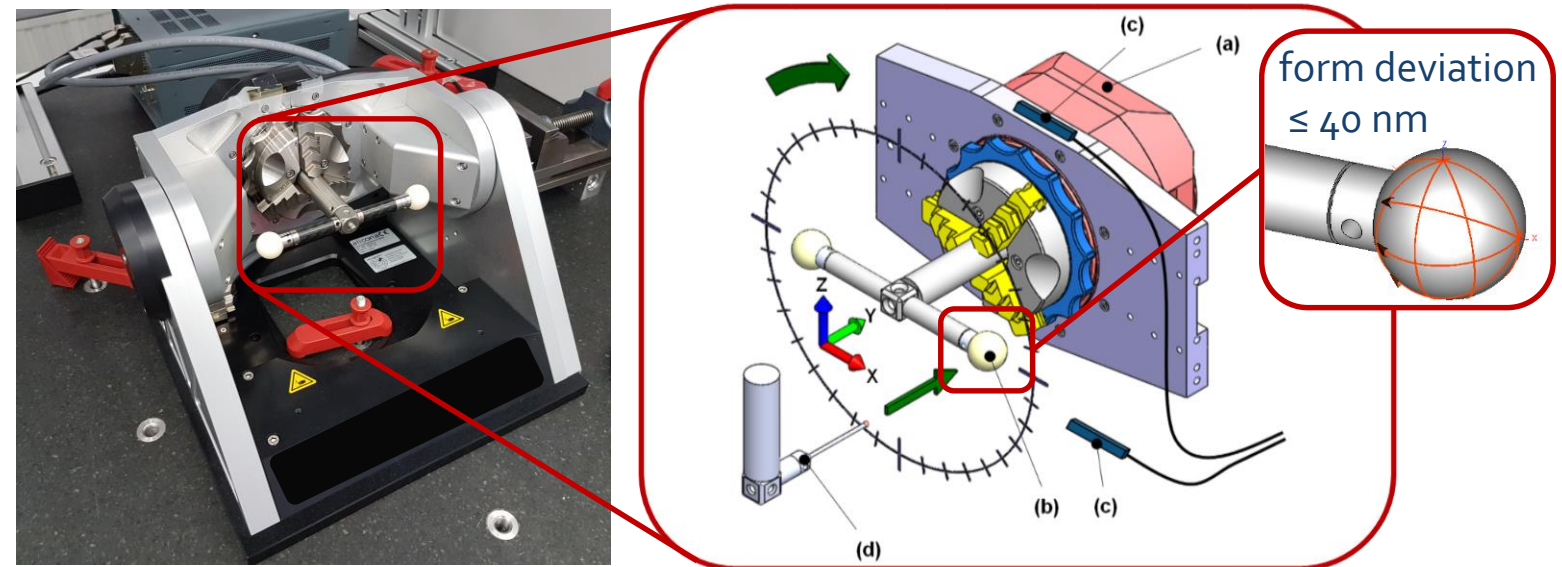


Fig. 1. Experimental setup of the rotational unit: (a) step motor; (b) ball measurement standard-BMS; (c) temperature sensors; (d) +Y-probe

RESULTS AND CONCLUSIONS

Static experiment:

(Ph2) max. axial deviation $\rightarrow 0.3 \mu\text{m}$

(Ph1) max. axial and radial deviation $\rightarrow 1.8 \mu\text{m}$

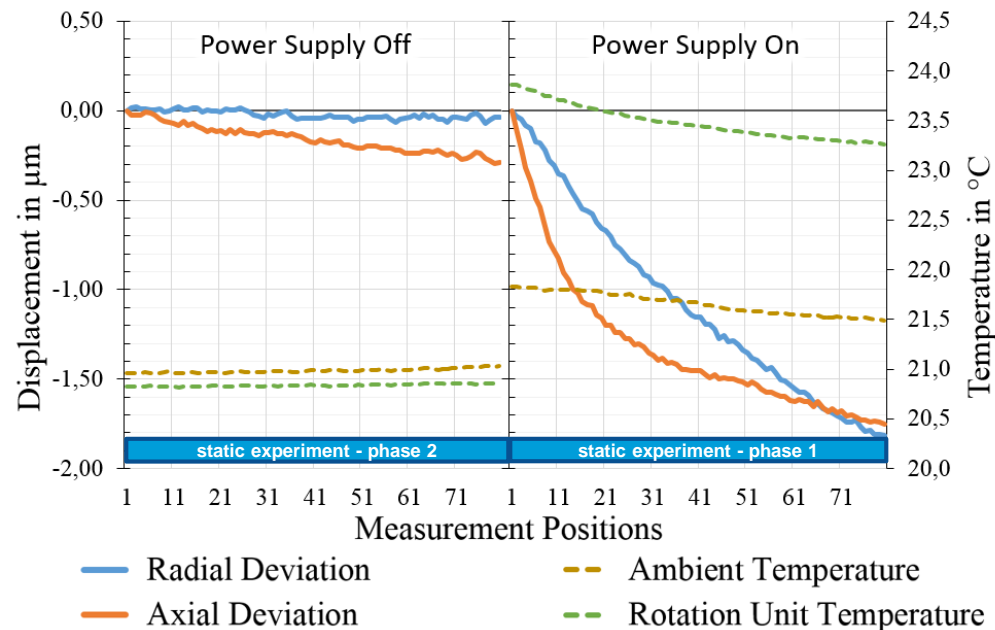


Fig. 2. Profiles of BMS sphere centre point position in axial and radial direction; static experiment phases 1 (power supply on) and 2 (power supply off)

Rotatory experiment:

(Ph4) both deviations \rightarrow quite similar

(Ph3) axial position reacts more, ascending trend

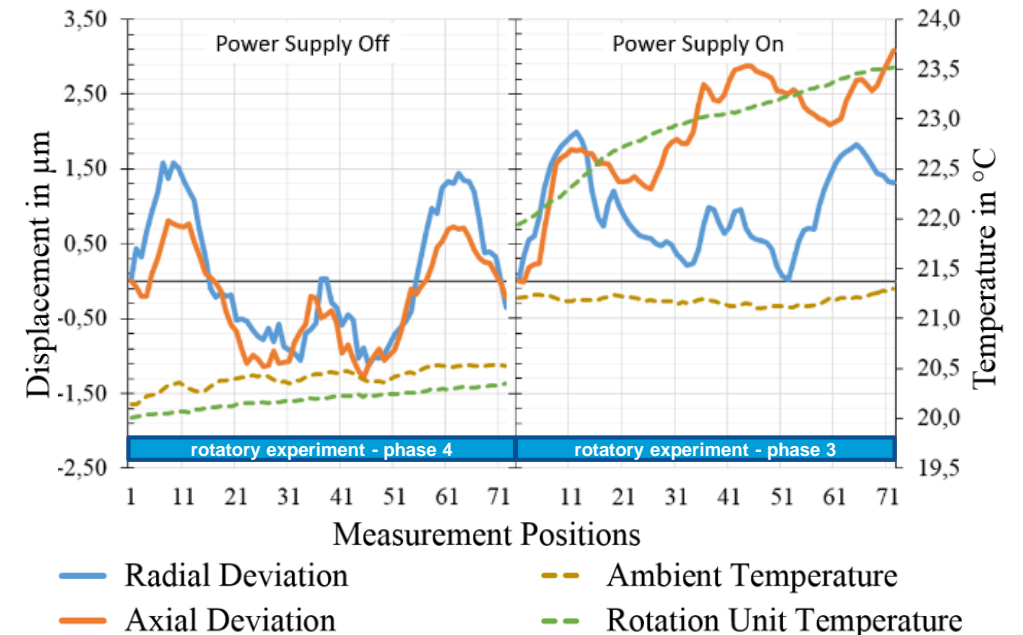


Fig. 3. BMS sphere centre point position profiles in axial and radial direction; rotatory experiment phases 3 (power supply on) and 4 (power supply off)