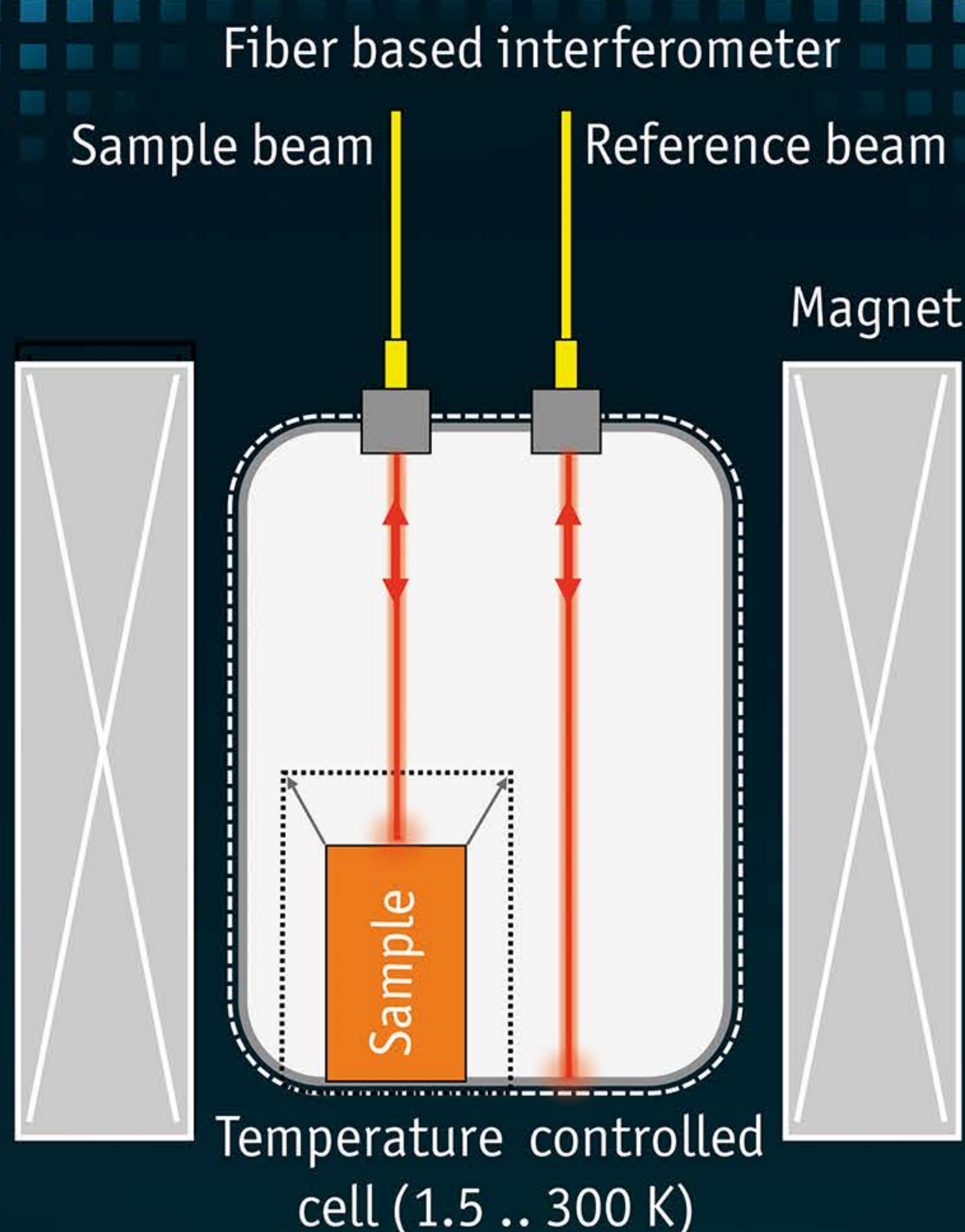


NEW

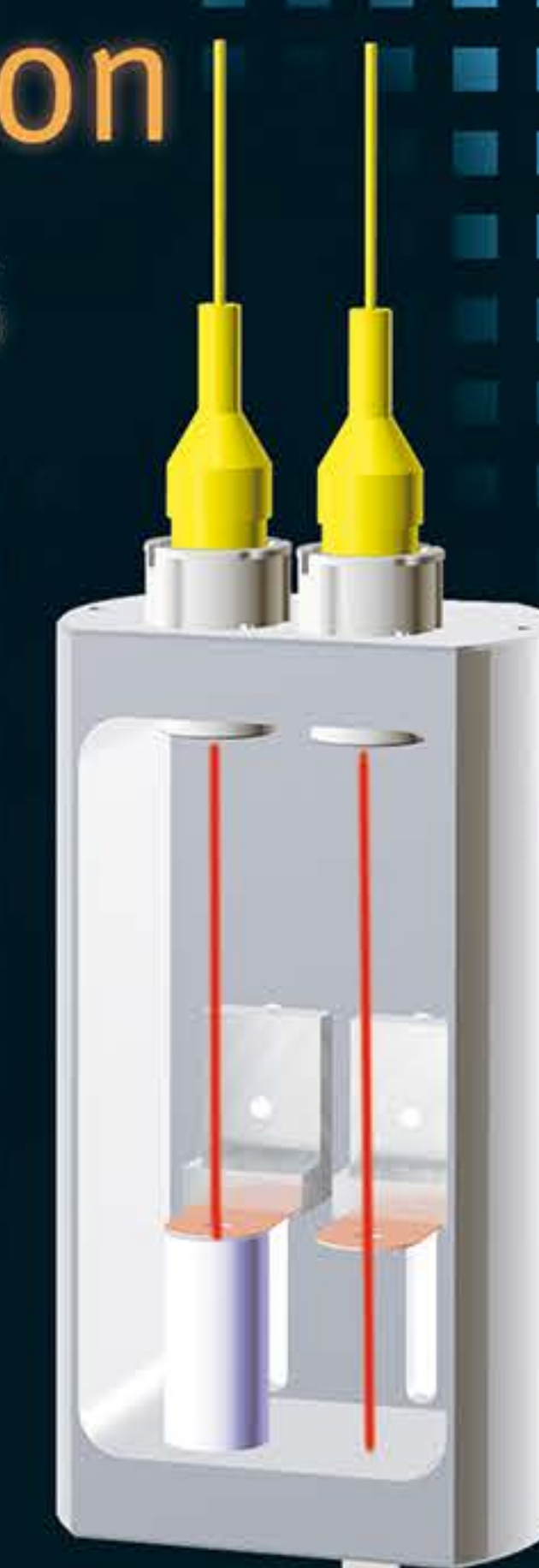
Measure **thermal expansion & magnetostriction** at low temperatures & in high magnetic fields



Temp. range



9 T magnet



Working principle:

- Sample beam measures expansion or contraction of sample
- Reference beam measures expansion or contraction of cell
- Difference between the two signals yields the absolute change in length ΔL
- Calculate thermal or magnetic strain as ratio between ΔL and the initial length L_0

Key features:

- Based on a miniature fiber based interferometer
- Reference beam for cell effect compensation
- Demonstrated resolution down to 1 nm (absolute) on mm-sized samples (1 ppm)
- Sensor resolution down to 1 pm (or 1 ppb on mm-sized samples)
- Compatible with cryogenic temperatures (1.5 .. 300 K)
- Compatible with high magnetic fields (e.g. 9 T)
- Sample size 2 .. 30 mm

attoDRY2100

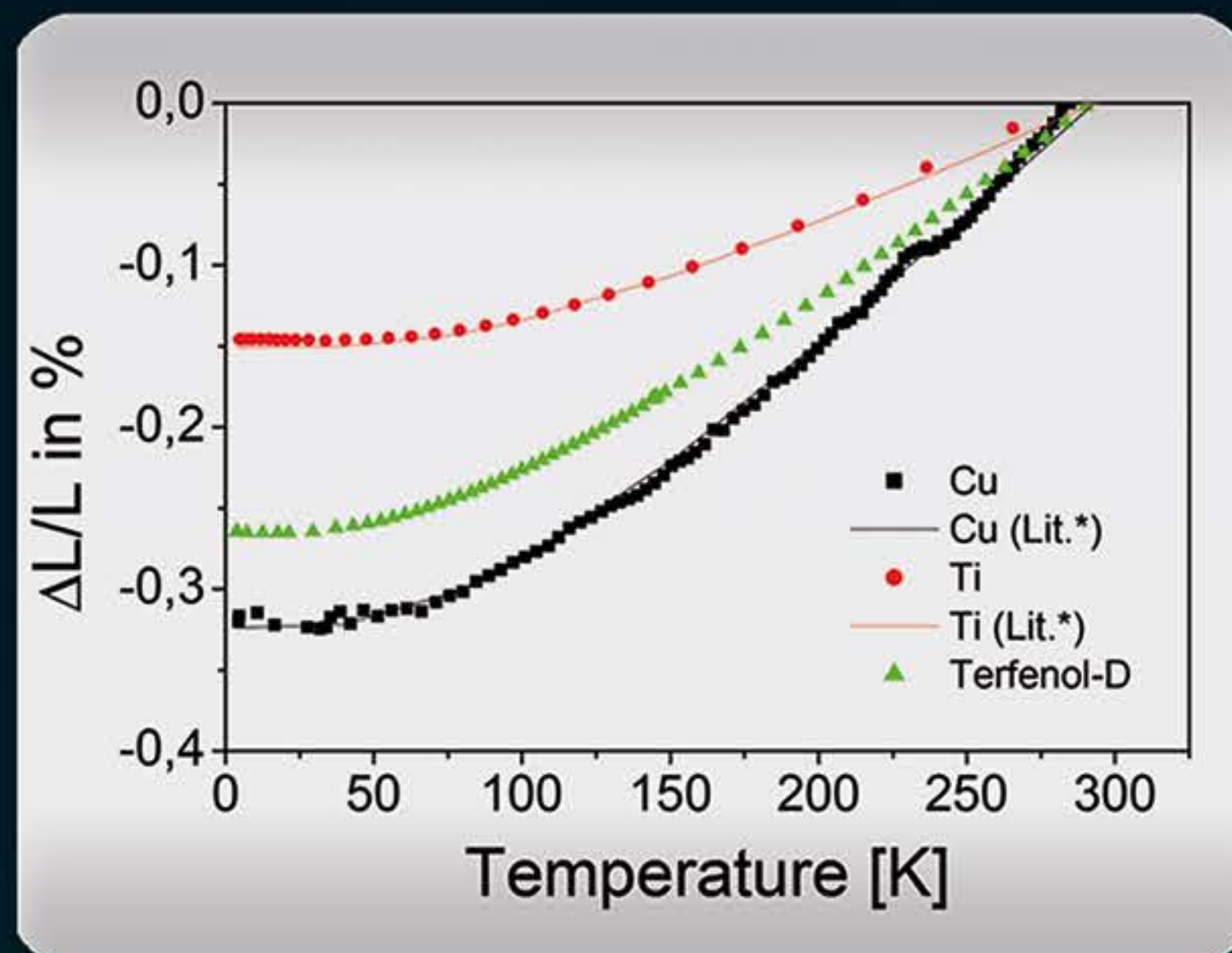
toploading, dry low vibration cryostat

- **Base temperature 1.5 K**
- Fully automated gas handling and temperature control 1.5 K – 300 K
- Touchscreen control of field and temperature
- Superconducting 9 T magnet (others on request)



Main Applications

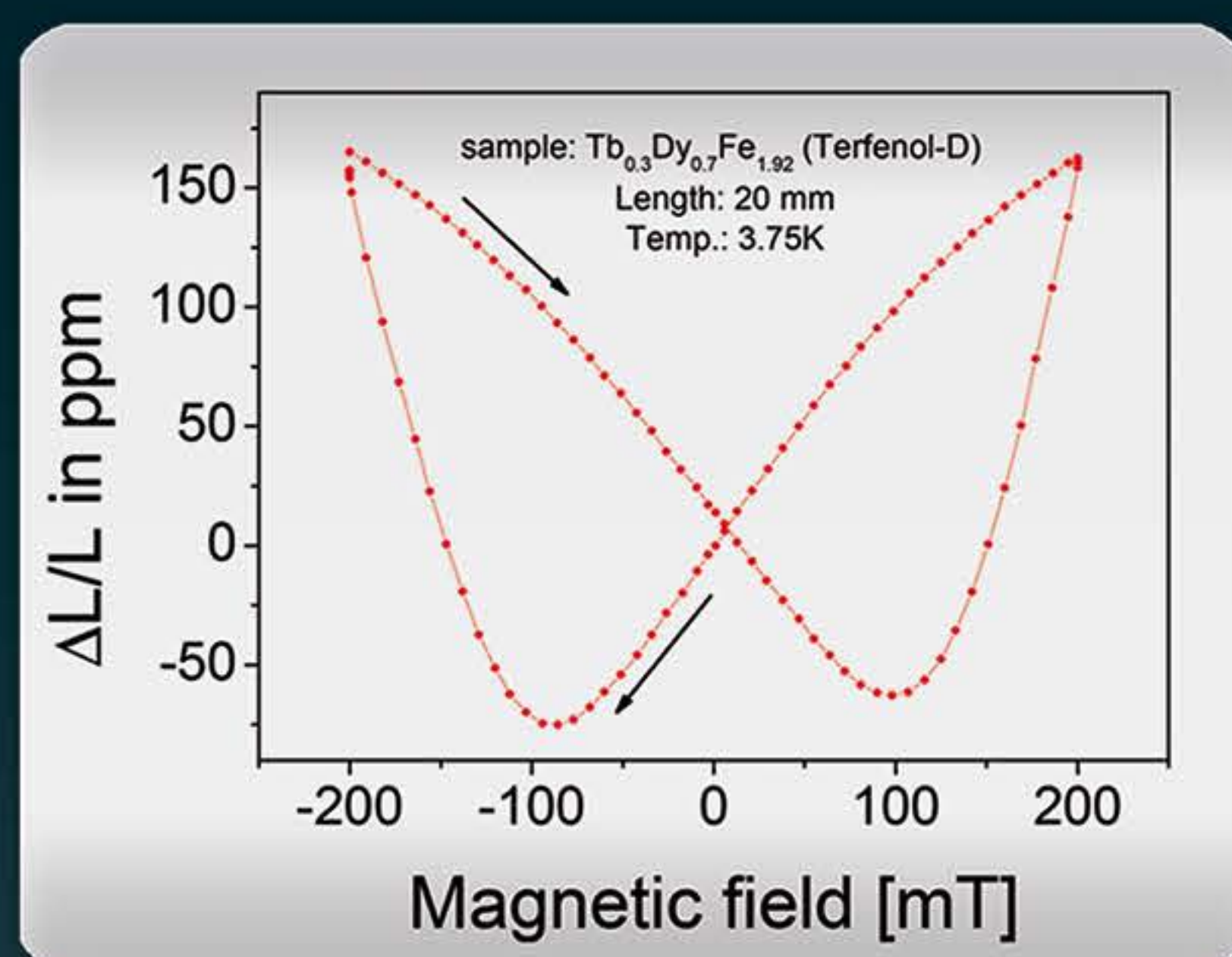
THERMAL EXPANSION



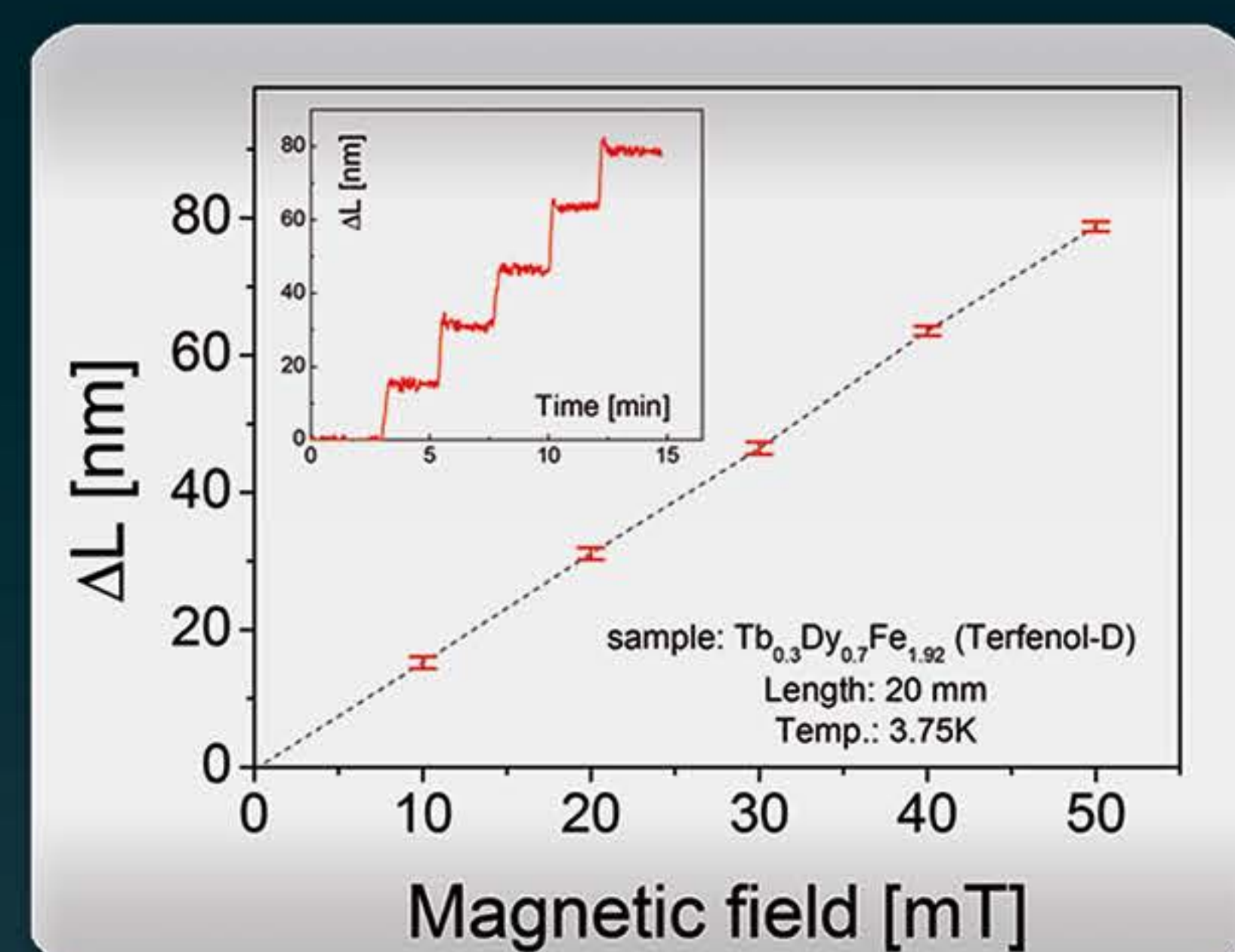
*Clark, A. F. (1983). "Thermal expansion", Chapter. 3 in "Materials at Low Temperatures", eds. R. P. Reed and A. F. Clark, ASM International, Materials Park, Ohio

- Thermal strain and expansion of cryogenic elements, compounds and technical materials over a wide temperature range
- Magnetic strain and magnetostriction of multiferroics, (anti-)ferromagnets, etc.
- (Structural) phase transitions

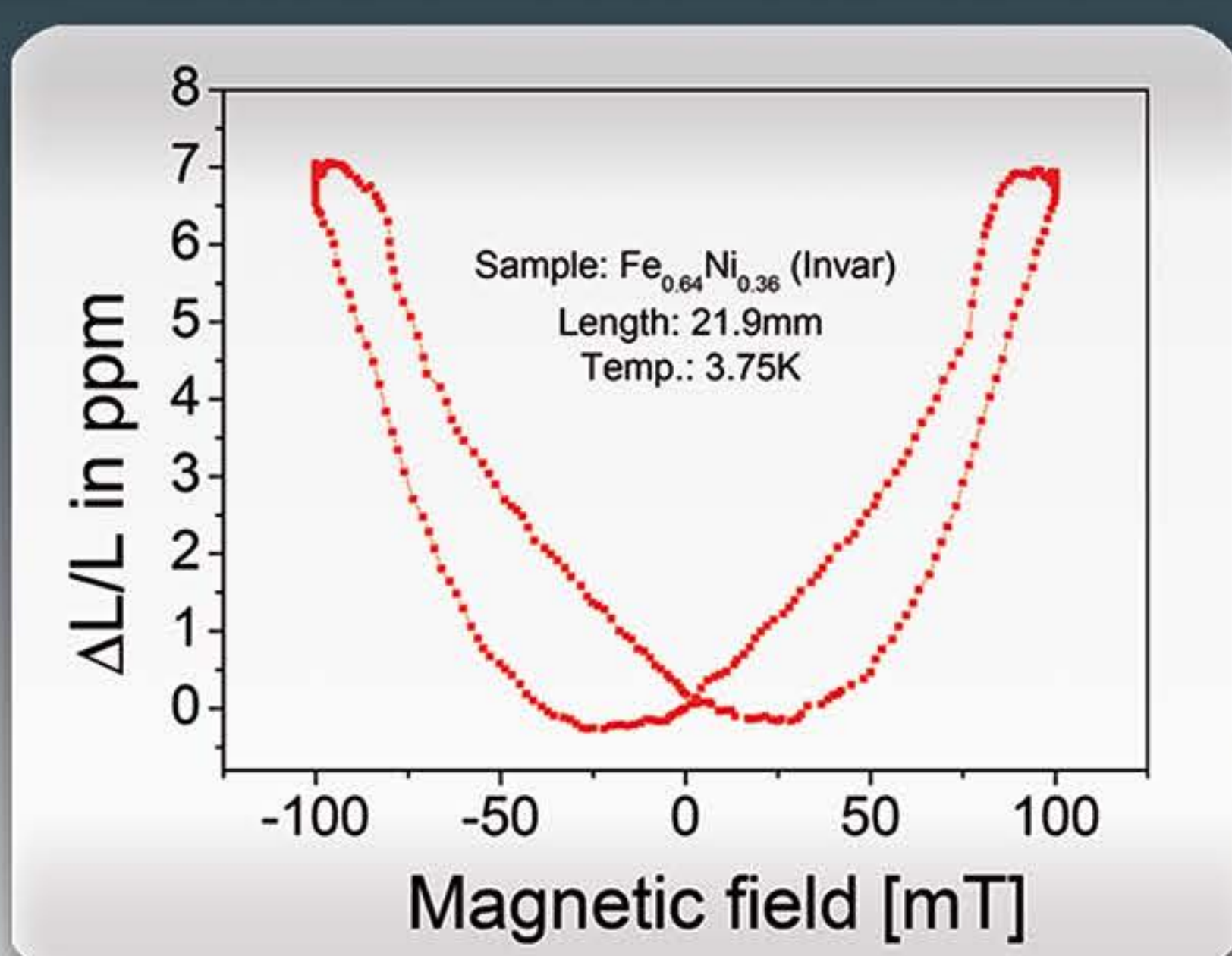
MAGNETOSTRICTION TERFENOL-D



SIGNAL-TO-NOISE



MAGNETOSTRICTION INVAR



MINIMAL CELL EFFECT

