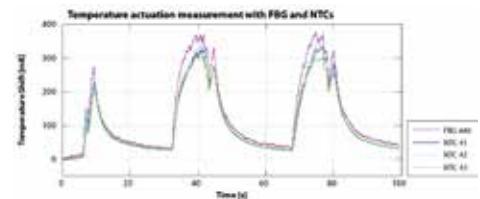


HIGH RESOLUTION TEMPERATURE MEASUREMENTS



ASML required high resolution (mK) temperature mapping within the lithography machine. As a research topic, ASML was investigating the feasibility of a single fiber alternative to 100 electrical wires to accommodate 50 NTCs in a small surface area.

To achieve high resolution interrogation the complete assessment of every used component was required. Items considering FBG parameters (FWHM, reflectivity), SLD-noise, Electronics noise, and others, enabled a well-educated estimate of the final performance of the system.

The single fiber proved itself a more than suitable alternative for NTCs.

1. All 50 sensors can spectrally be resolved and therefore measured with 28 kHz sampling.
2. High resolution sensitivity was achieved: a FBG strain resolution (std) up to 25 ne with 28 kHz sampling. Due to the fabrication quality of the FBGs there is an envelope in the reflectivity, consequently the same form of envelope is seen in the signal-to-noise of the FBG central wavelength.
3. And the NTC reference measurements showed that the FBGs have a very comparable temperature response curves. And even tend to have a shorter response time.

