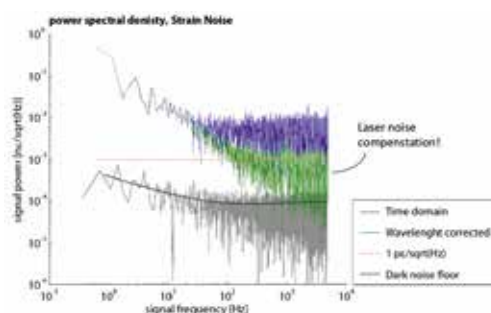


HIGH RESOLUTION STRAIN MEASUREMENTS

ASML requires high resolution strain sensing in their lithography machine in order to correct for nanometer vibration of the mechanics.

A scanning narrow-linewidth laser, aligned to a pi-shift FBG, is inserted into an on-chip unbalanced Mach-Zehnder interferometer (MZI), i.e. "*PalawanGator*". The MZI functions as a wavelength tracker and can measure the optical power simultaneously; from this information a spectrum can be generated, and the FBG wavelength can be determined with high accuracy.



Even though the scanning laser is narrow linewidth laser, implying that a low wavelength noise during modulation, the linewidth 'noise' can cause a white noise floor when looking into non-wavelength corrected algorithms. With the *PalawanGator* these miniscule deviations can be measured and compensated for in the strain/temperature measurements. Strain values up to 0.2 ne can be measured, depicted by the power spectral density of the strain noise.



OEM PalawanGator

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