GWADW2016 - Impact of Recent Discoveries on Future Detector Design



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Photoelasticity of Silicon and its temperature dependence

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The photoelastic coefficients p11-p12 and p44 of silicon for light of a wavelength of 1550 nm was measured using a rotating quarter wave plate polarimeter. The results p11-p12 = (-0.1139 \pm 0.0014) and p44 = (-0.0501 \pm 0.0014) for room temperature agree well with previously published data for various wavelengths. Additional measurements for the temperature dependence of the p11-p12 coefficients were done using a similar setup combined with a cryostat allowing sample temperatures down to about 10 K. The measurements show a temperature dependence with a maximum deviation of about 10% relative to the room temperature value.

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