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Phase and time-dependent second harmonic measurements of centrosymmetric materials

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Optical second harmonic generation (SHG) is widely used as non-invasive technique to probe surfaces and interfaces of centrosymmetric materials, e.g. silicon/silicon dioxide (Si/SiO2) and the bulk crystal structure of non-centrosymmetric materials such as silicon carbide (SiC). The time-dependent SHG observed at the Si/SiO2 interface of a bulk Si is caused by multiphoton excitation of electrons from the Si valence band to the oxide conduction band, resulting to their slow diffusion into the oxide surface traps. An interfacial electric field gradually builds-up which enhances the generated SH by electric field induced second harmonic (EFISH) generation over several minutes. In this work, an experimental setup-up, for frequency-domain measurement of SH phase as well as the time dependent second harmonic measurements of p-doped Si, will be presented and the obtained results are shown and discussed.

Apply to be
 considered for a student
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No

Level for award
 (Hons, MSc,
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N/A

Main supervisor (name and email)
and his / her institution

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Would you like to
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 Proceedings (Yes / No)?

No

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