



SFB/TRR 21 - Seminar

11. April 2014, Stuttgart

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Structural and optical properties of nanocrystalline silicon thin films

The first part of my talk will be devoted to the discussion of investigation of new types of system based on silicon and silicon carbide nanocrystals in semiconductor matrices, which possess both efficient luminescence and electrical current injection. It was shown that such a system can be prepared by thermal annealing of amorphous silicon layers as well as direct deposition of silicon and silicon carbide atoms. These thin films containing silicon and silicon carbide nanocrystals may possess efficient and stable luminescence that open a new possibility to prepare silicon based luminescent films, which can be used in light emitting devices. The second part of the talk will be devoted to microresonator based frequency combs. In this work theoretical modeling of spectral – temporal dynamics of the parametric microresonator comb generation are done both with Lugiato – Lefever approach and coupled mode equations approach. And it was shown that both methods give the same results and predict soliton mode-locking inside of a resonator. Also some experimental aspects of procedure of crystalline microresonator formation are discussed.

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