Master Thesis:

Optimization of Optical Particle Properties under Uncertainty

Tasks

In the context of optimizing optical properties of crystal structures, exciting questions arise. In general, the task is to decide for each site in a lattice whether a so-called absorber or otherwise a non-absorber should be placed. The optimization goal consists in determining an assignment for each site that minimizes the distance to a desired color outcome. For this task, there already exists a practically efficient optimization method.

However, cracks may be present in the crystal that can strongly affect the color spectrum. It is highly desirable to extend the optimization approach by a (robust) protection against cracks. For nonlinear robust optimization, an algorithm has been developed recently.

The task of the master thesis consists in performing a literature research. Then, the goal is to integrate these two existing approaches. The aim is to develop and to implement an integrated approach with some algorithmic specifications, building upon the available methods. Knowledge in particle design is not necessary, however a background in optimization is recommended, for example in mixed-integer or in nonlinear or in robust or in PDE-constrained optimization.

Contact

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Please send an email including your Transcript of Records, a short letter of motivation and the intended working period) to wima-abschlussarbeiten@lists.fau.de.