

Coherence and non-linearities in soft X-ray spectroscopy for materials science (extension and completion)

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Modern soft X-ray spectroscopies can provide a detailed view on the excitation spectrum of materials. Unfortunately though, the high selectivity and information depth of these spectroscopies traditionally comes at the expense of low signals. The recent advent of next generation X-ray sources changes this situation drastically. Making full use of the coherence and applying non-linear concepts promises higher signal levels, and sometimes even complementary or more specific information. The time is ready to transfer powerful experimental concepts from optical spectroscopies to the soft X-ray regime. First, various non-linear methods are used to study model systems. In a next step, applications to scientific questions in materials science are planned ranging from determining symmetries of excitations to spin and charge dynamics in materials for data storage and for solar energy harvesting. It is anticipated that the novel methodology can contribute to tailored functional materials which are needed for a sustainable future.

Projektbeteiligte

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