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## 【633】 Ultrafast Magnetization Dynamics in Arrays of Dipolar-Coupled Permalloy Nanostructures

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Despite more than two decades of research, the proposed microscopic mechanisms underpinning laser-induced ultrafast demagnetization in magnetic thin films are not fully established. Little attention has been paid so far to nano-sized systems, where dipolar coupling and shape anisotropy may play an important role.

We show that the optically-induced ultrafast magnetization suppression in arrays of parallel-oriented permalloy nanostructures can substantially differ from that of unpatterned thin films. In thin films, the Kerr signal increases before the material's demagnetization, suggesting an optically induced spin transfer (OISTR) between the sublattices of the alloy. In contrast, the efficiency of this mechanism is highly reduced in the nanostructures.

### Theoretical Work

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