Non-Hermitian Transistor-type Response in Low-symmetry Materials

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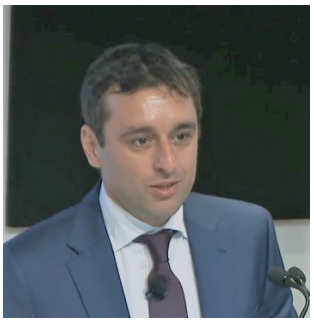
Abstract— Semiconductor transistors play a vital role in electronic circuits by amplifying and isolating voltage signals. While traditional transistors are point-type devices, the exploration of distributed transistor-type optical responses in bulk materials presents an exciting avenue of research. In this presentation, I will provide an overview of my group's research on distributed transistor metamaterials. I will demonstrate how the interplay between a static electric bias and material nonlinearities enables the design of non-Hermitian transistor-like responses in metamaterials, where the gain response is controlled by the field polarization handedness. Additionally, I will showcase the potential of materials with low-symmetry properties as promising platforms for realizing such distributed transistor responses.



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