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Plasmonic Wakes in a Semi-conductor

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The possibility of exciting wakefields in a semi-conducting structure is discussed. The fundamental limitation of short mean free paths of electrons in the semi-conductor can be overcome above a threshold beam or laser driver intensity when the electrons are driven to sufficient velocities that their Coulomb collision cross-section drops precipitously. The wakes differ from those in either a plasma, non-conducting dielectric or metallic structure. The nature of those differences and their potential advantages for plasmonic wakes as novel particle accelerator structures are described.

Acknowledgments

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