

标题: Optical control of entangled states in semiconductor quantum wells

作者: Rasanen, E (Rasanen, E.); Blasi, T (Blasi, T.); Borunda, MF (Borunda, M. F.); Heller, EJ (Heller, E. J.)

来源出版物: PHYSICAL REVIEW B 卷: 86 期: 20 文献号: 205308 DOI: 10.1103/PhysRevB.86.205308 出版年: NOV 8 2012

在 Web of Science 中的被引频次: 0

被引频次合计: 0

引用的参考文献数: 32

摘要: We present theory and calculations for coherent high-fidelity quantum control of many-particle states in semiconductor quantum wells. We show that coupling a two-electron double quantum dot to a terahertz optical source enables targeted excitations that are one to two orders of magnitude faster and significantly more accurate than those obtained with electric gates. The optical fields subject to physical constraints are obtained through quantum optimal control theory that we apply in conjunction with the numerically exact solution of the time-dependent Schrodinger equation. Our ability to coherently control arbitrary two-electron states, and to maximize the entanglement, opens up further perspectives in solid-state quantum information.

入藏号: WOS:000310849500005

语种: English

文献类型: Article

KeyWords Plus: INAS NANOWIRES; DOTS; SPINS; PULSES; PROBE

地址: [Rasanen, E.] Tampere Univ Technol, Dept Phys, FI-33101 Tampere, Finland

[Rasanen, E.] Univ Jyvaskyla, Dept Phys, Nanosci Ctr, FI-40014 Jyvaskyla, Finland

[Rasanen, E.; Blasi, T.; Borunda, M. F.; Heller, E. J.] Harvard Univ, Dept Phys, Cambridge, MA 02138 USA

[Blasi, T.] Tech Univ Munich, Dept Phys, D-85747 Garching, Germany

[Borunda, M. F.] Oklahoma State Univ, Dept Phys, Stillwater, OK 74078 USA

[Heller, E. J.] Harvard Univ, Dept Chem & Chem Biol, Cambridge, MA 02138 USA

通讯作者地址: Rasanen, E (通讯作者), Tampere Univ Technol, Dept Phys, FI-33101 Tampere, Finland.

电子邮件地址: esa.rasanen@tut.fi

出版商: AMER PHYSICAL SOC

出版商地址: ONE PHYSICS ELLIPSE, COLLEGE PK, MD 20740-3844 USA

Web of Science 类别: Physics, Condensed Matter

研究方向: Physics

IDS 号: 034DE

ISSN: 1098-0121

29 字符的来源出版物名称缩写: PHYS REV B

ISO 来源出版物缩写: Phys. Rev. B

来源出版物页码计数: 5