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放大和收窄量子波导中的声学声子输运和热导率

（1.吉首大学物理科学与信息工程学院，湖南 吉首 416000；2.湖南大学应用物理系，湖南 长沙 410082）

Acoustic-Phonon Transmission and Thermal Conductance in a Width-Change Quantum Waveguide

(1.College of Physics Science & Information Engineering,Jishou University,Jishou 416000,Hunan China;2.Department of Applied Physics,Hunan University,Changsha 410082,China)

全文: PDF (860 KB) HTML (1 KB) 输出: BibTeX | EndNote (RIS) 背景资料

摘要 运用散射矩阵方法，研究了在低温下量子波导宽度变化和长度L的变化对声学声子输运系数的影响.数值结果表明：当介电量子波导的宽度变化不大时，声学声子透射系数几乎不随宽度变化长度L的变化而变化；当介电量子波导的宽度变化比较大时，声学声子透射系数随长度L的增大而增大；当温度很低时，介电量子波导的宽度变化对热导率几乎没有影响，当温度升高时，热导率随长度L的增大而增大.

关键词： 声子输运 热导率 散射矩阵法

Abstract: The authors investigate the effect of the value change of L on low temperature phonon transport in a width-change quantum waveguide by using the scattering-matrix method.The calculated results show that the transmission coefficient almost doesn’t change when the width of the quantum waveguide changes small,but it will become large with the value increase of L when the width of the quantum waveguide changes more.And at low temperature,the thermal conductance almost doesn’t change with the width-change of the quantum waveguide,but it will become large with the value increase of L when the temperature hoists.

Key words: phonon transport thermal conductance scattering-matrix method

作者简介：叶伏秋（1967-），男，湖南益阳人，吉首大学物理科学与信息工程学院副教授，湖南大学硕士生，主要从事凝聚态物理研究.

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