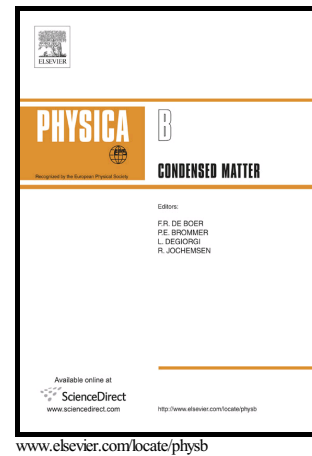


Tight binding calculation of tunneling conductance
of a metal/ferromagnetic junction

Aek Jantayod



PII: S0921-4526(17)30573-2
DOI: <http://dx.doi.org/10.1016/j.physb.2017.08.080>
Reference: PHYSB310220

To appear in: *Physica B: Physics of Condensed Matter*

Received date: 16 January 2017
Revised date: 24 August 2017
Accepted date: 29 August 2017

Cite this article as: Aek Jantayod, Tight binding calculation of tunneling conductance of a metal/ferromagnetic junction, *Physica B: Physics of Condensed Matter*, <http://dx.doi.org/10.1016/j.physb.2017.08.080>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Tight binding calculation of the tunneling conductance of a metal/ferromagnetic junction

Aek Jantayod

Department of Physics, Faculty of Science, Naresuan University, Phitsanulok 65000, Thailand

Research Center for Academic Excellence in Applied Physics, Faculty of Science, Naresuan University, Phitsanulok 65000, Thailand

Abstract

A tight binding approximation was used to describe the electronic properties of a metal/ferromagnetic junction in a one-dimensional system. The appropriate boundary conditions were calculated to describe the quality of the interface, the non-spin-flip and spin-flip scattering potential. The BTK model was used to compute the reflection and transmission probabilities, and the Landauer formulation was used to calculate the conductance spectrum. It was found that the conductance spectrum changes slope at the bias voltage that reached the bottom of the minority band and the top of the majority band of the ferromagnetic. The conductance spectrum was suppressed for all energies when either the non-spin-flip or spin-flip scattering at the interface increased. However, the conductance spectrum can be enhanced when the interface was taken into account for the appropriate value of the spin-flip and non-spin-flip scattering. In addition, the conductance can be increased by increasing the next-nearest neighbor hopping energy in the ferromagnetic material.

Keywords: A metal/ferromagnetic junction, Tight binding approximation, Tunneling conductance, Lattice model

Email address: `aekj@nu.ac.th` (Aek Jantayod)

Download English Version:

<https://daneshyari.com/en/article/5491657>

Download Persian Version:

<https://daneshyari.com/article/5491657>

[Daneshyari.com](https://daneshyari.com)