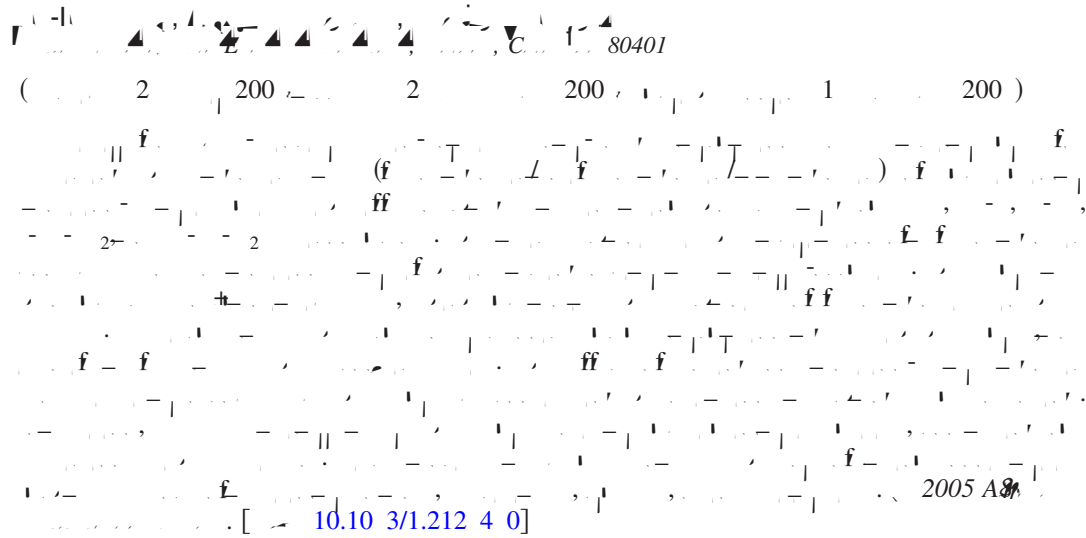




Practical effects of biologically controlled ferromagnetism of 3d impurities in semiconductors



I. INTRODUCTION

The concentration of 3d impurities in semiconductors is typically in the range of 10^{17} to 10^{21} cm $^{-3}$. The magnetic properties of these impurities are strongly influenced by the surrounding crystal field and the presence of other impurities. The interaction between the impurity spins and the conduction electrons leads to the formation of magnetic clusters, which can significantly affect the electrical and magnetic properties of the material. The study of these effects is crucial for the development of spintronic devices and quantum computing applications.

$\Psi_{T=1} = \frac{1}{\sqrt{2}} (\Psi_{T=1}^x + \Psi_{T=1}^y)$
 $\Psi_{T=1}^x = \frac{1}{\sqrt{2}} (\Psi_{T=1}^x + \Psi_{T=1}^y)$
 $\Psi_{T=1}^y = \frac{1}{\sqrt{2}} (\Psi_{T=1}^x - \Psi_{T=1}^y)$
 $\Psi_{T=1}^z = \Psi_{T=1}^z$
 $\Psi_{T=1}^c = \Psi_{T=1}^c$

II. MAGNETISM AND IMPURITY ORBITAL CHARACTER

$\Psi_{T=1} = \frac{1}{\sqrt{2}} (\Psi_{T=1}^x + \Psi_{T=1}^y)$
 $\Psi_{T=1}^x = \frac{1}{\sqrt{2}} (\Psi_{T=1}^x + \Psi_{T=1}^y)$
 $\Psi_{T=1}^y = \frac{1}{\sqrt{2}} (\Psi_{T=1}^x - \Psi_{T=1}^y)$
 $\Psi_{T=1}^z = \Psi_{T=1}^z$
 $\Psi_{T=1}^c = \Psi_{T=1}^c$

... () ... f () ...
 ... () ... T () ... 32,34
 ... T_3 ... %
 ... () ()
 ... 32,3
 ... f ... T ...
 ... 3 ...
 () ... f () ... ()
 ... () ... f ...
 (3,1) () ... () ...

... 2,32 ... 33
 ... (f.) (... , -4300 ... f ... 0 ... , -1.2 ... -4300 ...

