Magnetoresistance Studies on Ellipse-Patterned La0.7Sr0.3MnO3 Micro-Wires

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ABSTRACT

本論文之研究主要在探討橢圓形狀鑭鍶錳氧微米線之形貌對磁阻之效應，我們已知鑭鍶錳氧薄膜的金屬－絕緣體特性轉換溫度大於300 K，在室溫300 K時，有較佳的磁阻變化率。將鑭鍶錳氧薄膜沉積在晶格匹配佳的鈦酸鍶單晶基板上，探討圓形與橢圓形形貌對鑭鍶錳氧微米線磁阻特性之影響。　　此外，我們在鈦酸鍶基板上製作階梯晶界，再沉積鑭鍶錳氧薄膜製作通過晶界的微米線，探討晶界在低溫低磁場的磁阻效應。　　經由PPMS（Physical Property Measurement System）的量測－得知鑭鍶錳氧微米線經過階梯晶界之後，有較大的磁阻變化率，經過分析應為穿隧效應之磁阻行為。　　最後，由一系列的量測，我們可發現到在居禮溫度以下時，磁阻隨外加磁場和溫度變化的特性分析，進而探討形貌效應對磁矩翻轉過程之影響。

Keywords : LSMO ; tunneling magnetoresistance ; step junction

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