Thesis Title	The Applications of Superconducting Magnetoresitive Device
Student	Mr. Somsak Yongyingsakthaworn
Thesis Advisor	Assoc.Prof.Dr. Somkiat Supadech
Thesis Co-advisor	Asst.Prof.Dr. Wisut Titiroongruang
Level of Study	Master of Engineering in Electrical Engineering
Department	Electronics Engineering, King Mongkut's Institute of Technology Ladkrabang
Year	1997

Abstract

For this thesis , the applications of superconducting magnetoresistive device are proposed , including the supplementary study on magnetic properties of superconductor which is necessary to the application as following briefly.

In the study on magnetic properties of ceramic superconductor , it is found that superconductor resistivity are linearly proportional to external magnetic density ,called magnetic sensing property or magnetoresistance effect. At Superconductivity Laboratory , Electronics Research Center , Faculty of Engineering , King Mongkut's Institute of Technology Chaokhuntaharn Ladkrabang , the principle has been applied to invent a novel magnetic sensor by using Yttrium type ceramic high temperature superconductor which is the first achievement in Thailand[1] . This sensor obtains very high sensitivity to low magnetic field between 10^{-5}-10^{-2} T as well as its low frequency response of 0-500 Hz . Furthermore , our laboratory also discovered the significant properties ; for example in alternating magnetic signal , superconducting magnetic sensor generates output signal of full-wave rectification[5] . Moreover , superconductor responds to D.C.Hysteresis magnetic field equally in every direction , called isotropic property[2] . In addition , superconductor can be memorized by applied magnetic field which is greater than critical magnetic field , called magnetic memory effect[7]. Which ieads to D.C.hysteresis phenomenon in superconducting magnatic sensor. Besides , when alternating magnetic signal

applied to superconducting magnetic sensor with magnetic memory state , its output obtains half-wave rectification which appears only with different magnetic pole from the memory pole . By using the fascinating properties above , there are three applications of superconducting magnetic sensor introduced here such as non-contact current meter[2], nonvolatile memory and superconducting magnetic source directional finder [7].