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Development of Ultrahigh Sensitivity Scanning Nano-Hall Probe Microscopy and Nano-biomagnetic Devices for Medical diagnostics

Keywords: Magnetoresistive sensors, scanning Hall probe microscopy, magnetic colloids, self-assembly of magnetic nanoparticles, and magnetic biosensing

Theme1: Scanning Hall Probe Microscopy for high-temperature applications

Development of an SHPM for imaging magnetic domains at the surfaces of ferromagnetic materials at temperatures about the Curie temperature.

(Keyword: Hall sensors, magnetic domains, high temperature electronics)

Theme2: Nano-biomagnetic devices for medical diagnosis

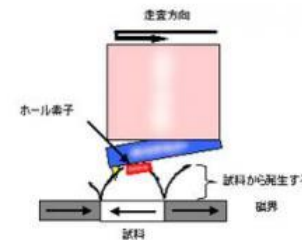
Hall sensors and magnetic particles for the development of point of care medical diagnostic systems

(Keyword: Biosensing, magnetic labels, medical diagnostics)

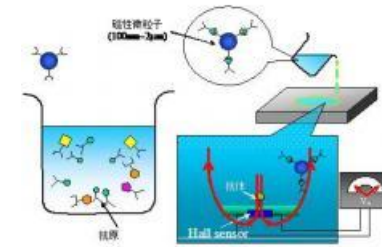
Theme3: AlGaN/GaN magnetic sensors for extreme environments

Fabrication of 2DEG AlGaN/GaN Hall sensors for monitoring magnetic fields under extreme conditions, such as high temperatures and harmful radiation.

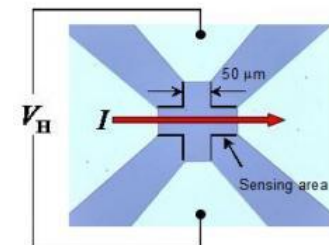
(Keyword: AlGaN/GaN Hall sensors, environmental monitoring)



Schematic of Scanning Hall Probe Microscope



Medical Diagnostics based on Magnetic Labels and Bio-Hall sensor



AlGaN/GaN Hall sensor