High Field Powered Magnets for NMR Spectroscopy

ID# 2013-4157





Keck Powered Magnet

Technology Summary

Nuclear magnetic resonance (NMR) spectroscopy requires an external magnetic field, and the resolution and signal to ratio of NMR methods scale directly with the field strength of the magnet. High-field powered magnets produce significantly greater fields that currently used superconducting magnets, but temporal field fluctuations from power supply ripple and cooling water temperature variations have precluded their use in NMR. This new device and method employs a cascade feedback control system with software to reduce field fluctuations of powered magnets down to levels comparable to a persistent magnet. The technology has been used to demonstrate standard NMR spectroscopy technique in a 25T powered magnet.

Application & Market Utility

NMR spectroscopy is of central importance in chemical, biological and materials science research. This technology permits use of extremely high powered magnets in NMR spectroscopy to achieve higher resolution. It also eliminates the use of expensive liquid helium cooling in the NMR spectroscopy.

Next Steps

Seeking research collaboration and licensing opportunities.

TECHNOLOGY READINESS LEVEL

4-7

Seeking

Investment | Licensing | Research

Keywords

- NMR
- spectroscopy
- powered magnets

Researchers

Jeffrey Schiano

Associate Professor of Electrical Engineering Online Bio

Brian Thomson

Assistant Professor of Instruction at Temple Website

Originating College

College of Engineering

Office of Technology Management Contact

Rokita, Joseph jjr152@psu.edu 814-863-6336



Invent Penn State is a Commonwealth-wide initiative to spur economic development, job creation, and student career success. Invent Penn State blends entrepreneurship-focused academic programs, business startup training and incubation, funding for commercialization, and university-community collaborations to facilitate the challenging process of turning research discoveries into valuable products and services that can benefit Pennsylvanians and humankind. Learn more at invent.psu.edu.

Penn State is an equal opportunity, affirmative action employer, and is committed to providing employment opportunities to all qualified applicants without regard to race, color, religion, age, sex, sexual orientation, gender identity, national origin, disability or protected veteran status.