Development and Test of a Magnetic Field Cloaking Device

Nils Feege

SBU Postdoc Spotlight, September 18, 2014
Our Research Team at Stony Brook

K. Capobianco-Hogan
R. Cervantes
J. Chang
B. Coe
K. Dehmelt
A. Deshpande
N. Feege
T. K. Hemmick
P. Karpov
Y. Ko
T. LaByer
R. Lefferts
A. Lipski
E. Michael
J. Nam
A. Quadri
K. Sharma
What Does A Magnetic Cloak Do?

‘True Invisibility Cloak’

‘Magnetic Cloak’

Simple design: Superconductor + steel layers

Fedor Gömöry et al.
DOI: 10.1126/science.1218316
Superconductors Push Out Magnetic Fields

Above

Below

‘Critical Temperature’

Magnetic Field

[Diagram of magnetic field lines above and below the critical temperature]
Superconductor Layer

![Diagram of magnetic field lines and a superconductor layer with reference position and magnetic field strength graph.]

- Magnetic Field Strength [mT]
- Position [mm]

Reference superconductor
Steel Layer
Cloak = Superconductor + Steel Layers Combined
Variety of Magnetic Cloak Applications

- Medical applications, e.g. MRI
- Future collider experiments, e.g. ePHENIX
- Medical applications, e.g. MRI