

Washington University in St. Louis

Washington University Open Scholarship

Volume 13

Washington University
Undergraduate Research Digest

Spring 2018

Loalization in Disordered Classical Magnets

Jordan Pack

Washington University in St. Louis

Follow this and additional works at: https://openscholarship.wustl.edu/wuurd_vol13

Recommended Citation

Pack, Jordan, "Loalization in Disordered Classical Magnets" (2018). *Volume 13*. 157.
https://openscholarship.wustl.edu/wuurd_vol13/157

This Abstracts J-R is brought to you for free and open access by the Washington University Undergraduate Research Digest at Washington University Open Scholarship. It has been accepted for inclusion in Volume 13 by an authorized administrator of Washington University Open Scholarship. For more information, please contact digital@wumail.wustl.edu.

LOCALIZATION IN DISORDERED CLASSICAL MAGNETS

Jordan Pack

Mentor: Erik Henriksen

Localization is an important concept in physics: in conducting materials, it describes the phenomenon where conduction electrons can become localized in space in the presence of disorder. Although it is most often studied in the context of charge or spin degrees of freedom, it is known to be a general property of waves traveling in a disordered media. Here, we measured localization in a lattice of permanent bar magnets, each one inch long, that are able to rotate freely but in fixed positions. With these magnets, we have measured the collective motion that results from the impetus of one rotating magnet at the edge of a square lattice, and in square lattices where each point has been shifted a small amount in a random direction. These measurements reveal the presence of localization by the damped collective motion of the magnets with increasing disorder. We will also share measurements of response to different frequencies and wave speed using the same freely-spinning magnets arranged in a one-dimensional line.