Introduction

Previous research on spin waves has mainly involved spin wave excitations and propagation in spatially uniform magnetic fields. This work reports high resolution time- and space-resolved imagining of spin wave propagation in spatially non-uniform magnetic fields.

Field Configurations

The wave number increases in a spatially increasing field and decreases in a spatially decreasing field. This change in wave number is also reversible, as shown by the sagging field.

Wave Number Characteristics

The wave number increases in a spatially increasing field and decreases in a spatially decreasing field. This change in wave number is also reversible, as shown by the sagging field.

Spatial Evolution

Spin waves undergo a change in wavelength during the propagation through spatially non-uniform magnetic fields.

Conclusion

- The carrier wave number of spin wave pulses increases in a spatially increasing magnetic field and decreases in a spatially decreasing magnetic field.
- The wave number change for a general spatially varying static field is reversible.
- These field dependent wave number properties present potential microwave signal processing applications.

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