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We are a theoretical physics team that work on magnetic systems modelling

SIMMAS

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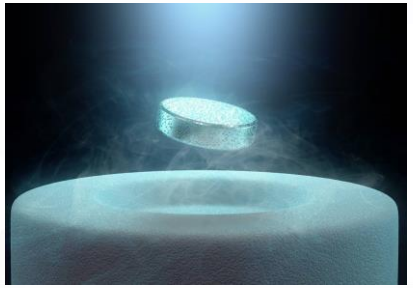
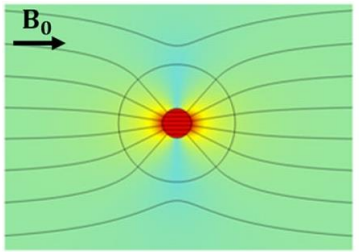
Our Research Fields

Superconducting Analitical and Numerical Modelling



Magnetic metamaterials modelling



Micromagnetism Modelling

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On-going Projects

- Magnetic levitation of superconductors as mechanical resonators
- Concentrating magnetic fields on-chip using metamaterials
- Skyrmion modeling

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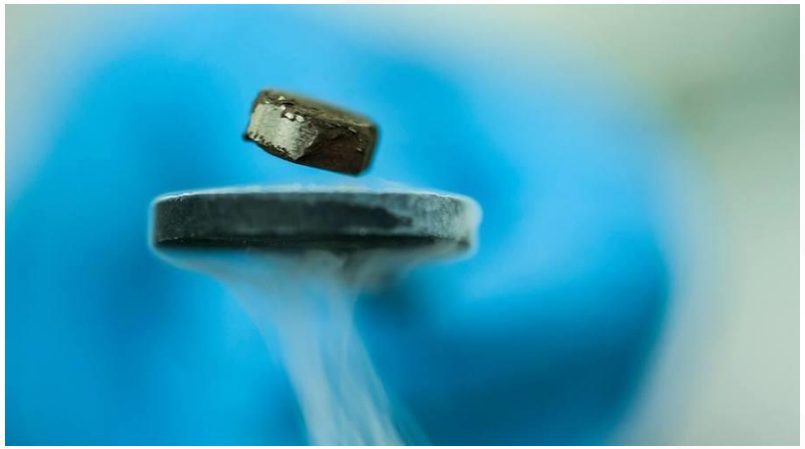
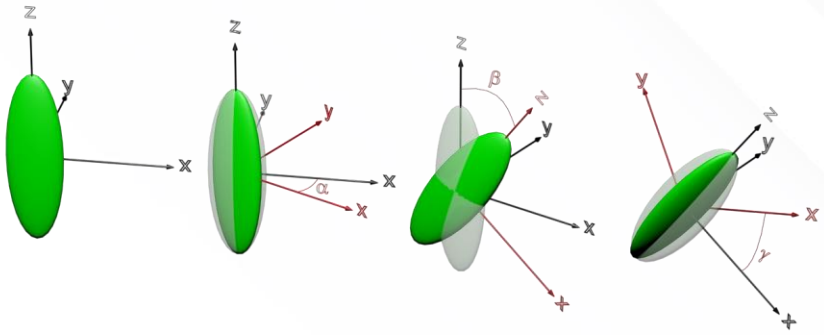
Levitation for quantum magnetomechanics



- Coupling magnetically levitated particles with superconducting quantum circuits
- Getting levitated microparticles to the ground state

- We model magnetically levitating particles to predict
  - The particle trapping frequencies
  - The trapping potentials where the particle sits



- With this, we can exert quantum control over the mechanical resonators.

Fundamental research, such as probing quantum mechanics at macroscopic scales
Quantum sensors and precision measurement

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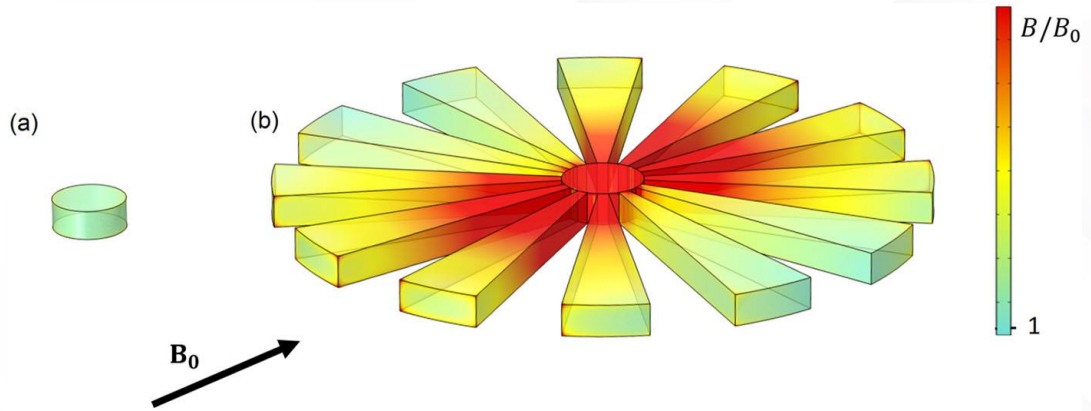
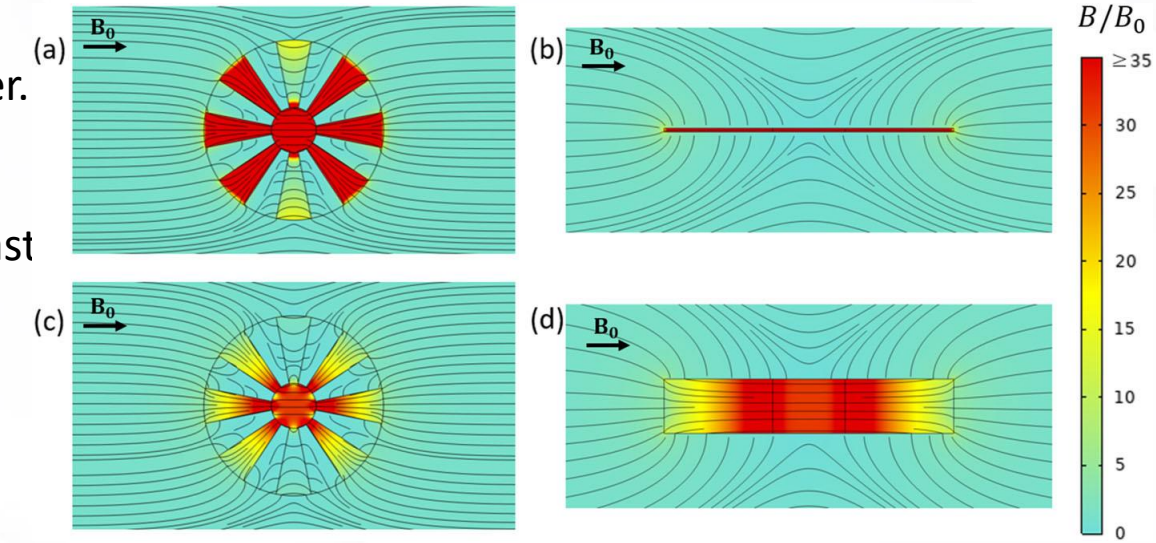
Concentrating magnetic fieds in-chip



- Mathematically model materials to concentrate magnetic fields on-chip.
- Work together with experimental groups to help each other.
- We have been able to concentrate magnetic fields to at least 150 times the applied field.



Useful for magnetic sensors

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