TRTM Dictionary of Magnonics 2025

Foreword

We have used the TRTM 2025 conference to start what was termed as “TRTM Dictionary of Magnonics” (the Dictionary). The aim is to create a document that will be of value to the community by providing common ground for further research and development and a useful starting point for those just starting their work in the field. We have agreed to adhere to the following principles in the process of developing the Dictionary.

(1) To remain **neutral** and **inclusive**, the Dictionary is based on the “contribution without attribution” principle. That is, it exists as an **open access** document under the authorship of “TRTM community”, while its contributors are able to opt in / out to be listed in an Appendix (possibly with a disclaimer listing definitions that they do not approve).

(2) We do **not** seek to publish the guide as a journal paper / book chapter, but anyone is able to post and distribute the Dictionary as they wish, e.g. to use its contents within their own publications and presentations.

(3) The Dictionary is updated **annually**, in line with the TRTM organisation cycle.

(4) The Dictionary is **free from references** and **claims of priority**.

(5) Whenever there are multiple competing AND sufficiently distinct definitions, all the definitions are listed.

(6) Where applicable (e.g. there are multiple versions that are not, however, sufficiently distinct), a summary of the discussion points is included.

(7) Terms and definitions included in one version of the Dictionary **remain open** for discussion and further improvement in subsequent editions of the Dictionary.

(8) This version of the Dictionary should be cited as: “TRTM Dictionary of Magnonics 2025” (TRTM Community, June 20xx), with the weblink to the TRTM 2025 website: https://trtm2025.sciencesconf.org/resource/page/id/22.

We will strive to devise a suitable and efficient process for collecting opinions on and debating the contents of the Dictionary. In 2025, the in-person discussion during the TRTM 2025 conference was most productive, while the Google-document-based continuation of the discussion did not receive much attention from the community. In 2026, we will an in-person discussion or discussions of the Dictionary at TRTM 2026, while seeking other ways for engaging with the wider magnonics community.

Section 1
Magnonics, its subfields and related fields

Magnonics is the science of magnons, spin waves and their applications.

To be defined:

1D magnonics
2D magnonics
3D magnonics
4D magnonics
5D magnonics
Antiferromagnetic magnonics
Cavity magnonics
Hybrid magnonics
Inverse-design magnonics
Magnon-spintronics
Neuromorphic magnonics
Optomagnonics
Photomagnonics
Quantum magnonics
THz magnonics
Topological magnonics
Ultrafast magnonics

Section 2
Magnonics devices and applications

Magnonic device is a device that derives its primary functionality or purpose from spin waves.

To be defined:

6G magnonic device
Magnonic transistor
Magnonic logic gate
Magnonic sensor
Magnonic computing
Magnonic arithmetic logic unit
Reconfigurable magnonic device
Reprogrammable magnonic device
Tuneable magnonic device

Section 3
Magnonic crystals and metamaterials

Magnonic crystal is a periodic medium or structure that supports spin waves and their manipulation enabled by spatially varying properties with a period greater than the atomic unit cell.

To be defined:

1D magnonic crystal
1.5D magnonic crystal
2D magnonic crystal
2.5D magnonic crystal
3D magnonic crystal
3.5D magnonic crystal
4D magnonic crystal
Artificial spin ice-based magnonic crystal
Magnon-phononic crystal
Magnonic band
Magnonic band gap
Dynamic magnonic crystal
Magnonic metamaterial
Magnonic quasicrystal
Magnonic time crystal
Reconfigurable magnonic crystal
Reprogrammable magnonic crystal
Tuneable magnonic crystal

Section 4
Other magnonic structures, effects, and phenomena

To be defined:

Magnon
Spin wave
Electromagnon
Chiral magnonic resonator
Magnonic Fabry-Pérot resonator
Magnonic resonator
Magnonic conduit
Magnonic waveguide

Appendix
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