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Towards two-dimensional magnon spin transport in ultrathin magnetic insulator films

Wei, Xiangyang

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Propositions

accompanying the dissertation

TOWARDS TWO-DIMENSIONAL MAGNON TRANSPORT IN ULTRATHIN MAGNETIC INSULATOR FILMS

1. Patience can increase efficiency.
2. Since the micro innovations nowadays on smartphones can not motivate people to upgrade their phones, the metaverse is more like a concept created by tech companies for persuading consumers to spend money.
3. Incompleteness of data can lead to wrong conclusions.
4. Simulations and models are usually based on reasonable assumptions. But if they cannot describe the experimental results, check those assumptions.
5. The magnon spin conductivity increases dramatically when approaching the two-dimensional transport regime. With advanced film growth techniques, ultrathin films of yttrium iron garnet can be a robust platform for the research and the utilization of a two-dimensional magnon gas under room-temperature conditions. [Chapter 4, 6].
6. The magnon spin conductivity σ_m linearly varies with the density of magnons n_m in a dilute magnon gas, i.e. $\sigma_m \propto n_m$, which is no longer valid in an overpopulated magnon gas. In an overpopulated magnon gas, the signals of magnon transport can be amplified efficiently [Chapter 5], and the magnetic order can also be significantly affected [Chapter 7].
7. *"If we are to live together, and not die together, we must learn a kind of charity and a kind of tolerance, which is absolutely vital to the continuation of human life on this planet."* - Bertrand Russell
In dealing with global challenges like global warming and COVID-19 pandemic, joining individual forces is the only solution.

Xiangyang Wei