

Seminar : Yuta Yamane

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January, 18th 2024 at 11 AM
IJL – 4-014

Emergent electromagnetic inductance of spintronics-effects origin



Inductor is one of the most vital electronic components used everywhere around us. Its working principle has been essentially the same ever since its earliest inventions in 19th century; a conducting coil mediates the energy conversion between an electric current and a magnetic field based on classical electromagnetism. Recently, a new inductance of spintronics-effects origin was predicted and experimentally demonstrated to arise in magnetic materials, and coined as emergent inductance. The emergent inductance can be formulated based on a dynamical Berry phase of electrons, where the role of the electromagnetic potential in the classical inductance is played by a spin-dependent Berry connection. The discovery of the emergent inductance has reopened the textbook of electronics, and we are at the beginning of a new chapter exploring quantum mechanical mechanisms of electromagnetic inductance. In the talk, we discuss recent progresses in the research field and our theoretical proposals.

Séminaire organisé dans le cadre du projet de programme interdisciplinaire MAT-PULSE



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