Physik-Kolloquium

Dienstag, den 12.11.2019, 17.00 Uhr

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Levitons: on-demand electrons for Electron Quantum Optics

Electron Quantum Optics is an emergent field of quantum Physics where the aim is to perform experiments and tasks with single electrons in quantum conductors in a way similar to what is done in Quantum Optics with single photons. I will particularly focus on the generation of Levitons which are minimal excitation states providing ideal single electron excitations and which allow the experimental realization of electronic Hong Ou Mandel interference [1] or Quantum State Tomography [2]. I will extend these notions to the case of fractionally charged anyons in the Quantum Hall regime and show microwave manipulation of e/3 and e/5 anyons [3] with the aim to realize anyon-levitons for future braiding measurements. Finally, I will discuss how levitons can be applied to classical electromagnetic or acoustic waves for applications in digital communications or in music sound synthesis.