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SD03 : Noise and fluctuations in electronic systems

Organizers: Carles Altimiras (SPEC), Bruno Guillet (GREYC), Jean-Guy Tartarin (LAAS)

Invited Speakers: To be confirmed

Content:

In any electrical measurement, there are fluctuations (noise) that we would like to avoid or reduce in order to obtain more accurate measurements. Measuring these current or voltage fluctuations is a powerful tool for understanding electronic transport. At low frequencies, the spectral density of fluctuations often follows a $1/f$ behaviour, and its level also serves as a very sensitive indicator of the quality of materials and devices. At higher frequencies, the study of electronic noise, both theoretical and experimental, allows the analysis of physical phenomena with time scales shorter than a nanosecond. Collective oscillation modes, linked to various electrical instabilities or plasma waves, can be explored through noise spectra. Measuring fluctuations also makes it possible to highlight fundamental properties in physics (Fermi-Dirac and Bose-Einstein quantum statistics, particle entanglement, fractional charges of the quantum Hall effect, etc.).

The aim of this mini-symposium is to bring together researchers working on noise and fluctuations in various electronic systems (from materials to detectors), in both fundamental and applied physics. This covers low-frequency $1/f$ noise in optoelectronic and electronic components, fluctuations at higher frequencies (GHz and THz), as well as the theory and modelling of noise sources.