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## Revealing Majorana bound states properties with electronic transport in three terminal devices

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場所 東京大学物性研究所本館 A615 号室

### Abstract:

Majorana bound states are quasiparticles with exceptional properties, which should appear at the boundaries of one-dimensional topological superconductors wires. The clear-cut experimental identification of these Majorana bound states in transport measurements still poses experimental challenges. In this talk, I will show that using three terminal devices out-of-equilibrium, and measuring transport properties like current and noise allow to get original signature demonstrating the Majorana bound states properties. I will first consider a junction where a topological superconductor (TS) wire is connected to two biased normal leads, and show that the sign of the current correlations is directed related to the presence of a Majorana bound state. Then I will consider a similar junction made of three TS wires. There I will show that the effective zero-energy Majorana state formed at the junction of the three TS wires is directly responsible for giant shot noise amplitudes, in particular at low voltages and for small contact transparency.

### References:

- T. Jonckheere, J. Rech, A. Zazunov, R. Egger, and T. Martin, Phys. Rev. B 95, 054514 (2017)
- T. Jonckheere, J. Rech, A. Zazunov, R. Egger, A. Levy Yeyati, and T. Martin, Phys. Rev. Lett. 122, 097003 (2019)