Contribution ID: **204** Type: **Talk**

【545】Towards spin-squeezing a solid

Friday 30 August 2019 12:45 (15 minutes)

The quantum-to-classical transition is one of the great frontiers of pure physics research. Generating large and long-lived entanglement is a path to exploring it. To reach this path we are using large ensembles of rare-earth ions doped into transparent crystals. Due to their appealing optical and microwave transitions, combined with unparalleled coherence properties, they have been a strong candidate for studying macroscopic entanglement. Here, we try to push the "macroscopicity"of the entangled state, both in atom number and coherence time, by spin-squeezing a large ensemble of Europium ions doped into Y2SiO5. To achieve this, we implement quantum non-demolition measurements on our solid-state system, using a frequency-domain optical interferometer. The generated spin-squeezed states will also be invaluable to quantum sensing.

Primary authors: Dr KACZMAREK, Krzysztof T. (University of Geneva); HAACK, Géraldine (Université de Genève); Dr ETESSE, Jean (University of Geneva); Dr TIRANOV, Alexey (University of Geneva); FRÖWIS, Florian (Group of Applied Physics, University of Geneva); Mr KRIVÁCHY, Tamás (University of Geneva); Prof. GISIN, Nicolas (University of Geneva); Dr AFZELIUS, Mikael (University of Geneva)

Presenter: Dr KACZMAREK, Krzysztof T. (University of Geneva)

Session Classification: Quantum Science and Technology

Track Classification: Quantum Science and Technology