MATTEO FADEL 'Detection of Bell Correlations in a Bose-Einstein Condensate'

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June 13, 2016

Seminar, June 13, 2016, 15:00. ICFO?s Seminar Room

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Measurements performed by different observers can show correlations stronger than any local deterministic theory allows. These Bell correlations are confirmed by violating a Bell inequality. I will present the results of our recent work, where we show experimentally that Bell correlations can be detected in a spin-squeezed Bose-Einstein condensate of about 480

Rubidium-87 atoms. Our result relies on a Bell correlation witness, derived from a multi-partite Bell inequality, that is violated by almost four standard deviations. This proves that Bell correlations are present in moderately entangled and experimentally accessible many-body systems, and that individually addressing or detecting the particles is not necessary.

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Hosted by Prof. Antonio Acin