



Contribution ID: 10

Type: **not specified**

Decoherence Measurements in Fullerene Interferometry

Tuesday 28 August 2007 09:45 (45 minutes)

We use a near field interferometer of Talbot-Lau type to investigate the wave particle duality of large molecules such as C₇₀ fullerenes. This device is also well suited to study the quantum-to-classical transition via decoherence mechanisms that occur quite naturally in such an interferometer. Interactions of the interfering particle with the surrounding environment lead to a collapse of the wave function and to a loss of the observed interference contrast in the following. In particular we study decoherence by collisions with various background gas particles as well as decoherence of very hot molecules by spontaneous emission of thermal photons. We complete our study by measuring the influence of mechanical vibrations on the interference contrast. Our measurements allow us to estimate how large molecules from proteins up to small viruses will be affected by decoherence and make predictions about the experimental requirements to show interference.

Presenter: Dr HACKERMULLER, Lucia (Johannes-Gutenberg University Mayence)

Session Classification: Coherence, Decoherence and Entanglement