

Séminaire organisé par

**AIM & Le service d'Astrophysique
CEA/DSM/Irfu**

DOES AN ATOM INTERFEROMETER TEST THE GRAVITATIONAL REDSHIFT?

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In a recent paper, H. Mueller, A. Peters and S. Chu claimed that gravimeters using atom interferometry provide a very accurate test of the gravitational redshift (or Einstein effect) at the Compton frequency associated with the rest mass of the atom.

In this seminar we analyze this claim in the framework of general relativity and of different alternative theories. We show that the difference of "Compton phases" between the two paths of the interferometer is zero in most theoretical frameworks used to interpret the various aspects of the equivalence principle. We thus conclude that atom interferometers do not test the redshift.

We also show that frameworks in which atom interferometers would test the redshift pose serious problems such as the violation of fundamental principles of quantum mechanics.

9 Juin 2011

14h30 Salle Galilée bât 713 C - Orme des Merisiers



Un café sera servi 15 mn avant le séminaire