



Séminaire du Laboratoire de l'Accélérateur Linéaire

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Sèvres

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Redefinition of the kilogram based on a physical constant

In the Système International d'unités (the SI), the unit of mass is the kilogram, which is defined as follows : Le kilogramme est égal...à la masse du prototype international du kilogramme. The international prototype referred to in the definition is an object that has been conserved and used at the BIPM since 1880s. All scientists will agree that the kilogram should be redefined; perhaps in terms of a physical constant of mass such as the electron mass, m_e ; perhaps in terms of the fundamental conversion factor between mass and frequency, h/c^2 . Until now, the challenge of realizing such a definition to the needed relative uncertainty (of order 10^{-8}) has been too difficult. Consider that the ratio $1 \text{ kg}/m_e$ is about 10^{30} and the de Broglie-Compton frequency ν defined by $1 \text{ kg} = (h/c^2)\nu$ is about 10^{50} Hz. Nevertheless, I will show that precise experimental realizations of both these routes to the kilogram are nearly complete. Prospects for a redefinition of the kilogram in 2011 will be discussed.

Salle 101 du LAL - Bât. 200, Orsay

Thé et café seront servis 1/4 h avant le séminaire

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