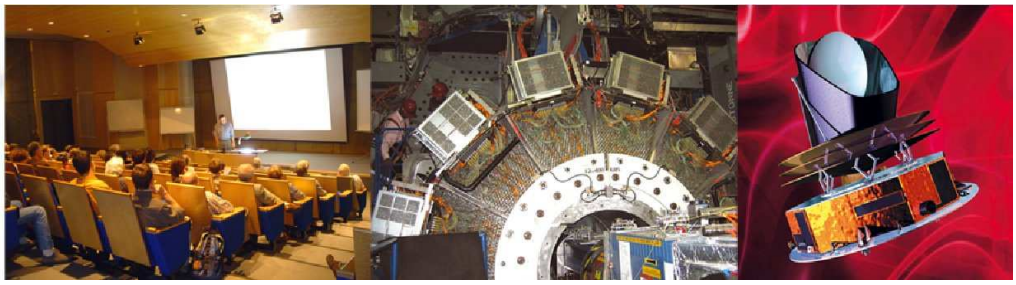
LABORATOIRE DE L'ACCÉLÉRATEUR LINÉAIRE



Séminaire du Laboratoire de l'Accélérateur Linéaire

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Vendredi 8 Mars 2013 à 14 :30

Nuclear burning wave reactor : Prometheus of the 3rd Millennium

A great interest for the future power engineering presents the development of new concepts of nuclear fission reactors with the so-called intrinsic safety, in which the development of uncontrolled chain nuclear reaction is impossible due to the physical principles of their operation. One of such concepts, proposed by Lev Feoktistov in 1988, is based on the self-sustained nonlinear regime of the nuclear burning wave (NBW) in a fast reactor. The critical state in such a reactor is kept automatically without external control due to a special kind of the negative reactivity feedback inherent in this regime. In addition to intrinsic safety, this concept has a number of other attractive features including the use of depleted uranium and thorium as a fuel, the long-term operation without refuelling and chemical reprocessing of fuel, the close fuel cycle and others. Several research groups study this phenomenon using different approaches and different names for it : Deflagration Wave, CANDLE, Nuclear Burning Wave, etc. Lately, the most frequently used name is the Traveling Wave Reactor due to the TerraPower and Bill Gates activity. This talk provides a brief overview of the main results of theoretical investigation aimed at the creation of the physical foundations of the NBW reactor. A special attention is focused on the study of a notable stability of the NBW regime. This stability is conditioned by the above-mentioned negative reactivity feedback, which is inherent to the NBW regime and provide the intrinsic safety of such a reactor.

Salle 101 du LAL - Bât. 200, Orsay

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

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