

The Abdus Salam International Centre for Theoretical Physics

United Nations Educational, Scientific and Cultural Organization

UNESCO

International Atomic Energy Agency

Technology and Applications of Accelerator Driven Systems (ADS)

17 – 28 October 2005 (*Miramare – Trieste, Italy*)

The Abdus Salam International Centre for Theoretical Physics (ICTP, Trieste - Italy), in cooperation with the International Atomic Energy Agency (IAEA, Vienna - Austria), is organising a Workshop on "Technology and Applications of Accelerator Driven Systems (ADS)", to be held at the ICTP in Trieste from 17 to 28 October 2005.

High-level waste disposal is an element of paramount importance in the discussion of nuclear power generation sustainability. This, and the desire to reduce the quantity of long-lived waste material, have stimulated new interest in the transmutation of actinides and some long-lived fission products, and in emerging system technologies for energy production with reduced actinide generation. One such system is the combination of a high-power particle accelerator with a sub-critical nuclear reactor in which the chain reaction is sustained by the external neutrons produced in a spallation source. It is claimed that such a reactor would have intrinsic safety features, and, apart from energy production and better long-term resources utilization (e.g., in connection with thorium fuels), it would be able to transmute long-lived radioactive waste into harmless or shorter-lived products. This would relax requirements for waste disposal, which is a major concern in the current application of nuclear energy.

The scope of the Workshop is training and information exchange. The objective of the Workshop is to familiarize the students with the status of the R&D activities in the area of ADS for energy production and transmutation. A review of the ADS designs presently under consideration will be given. The participants will study the theoretical foundation of all the ADS design aspects (i.e, high-power accelerator, spallation target, and sub-critical blanket), identify the most problematic areas, as well as the limitations of the simulation methods presently used. The students will be familiarized with the modern theoretical models used to predict nuclear reaction cross sections. They will study the principles of the evaluation methodology and become acquainted with existing data libraries and the data processing and transport calculations. Based on the discussion of the impact of the present uncertainties on the performance of the ADS, the needs for data and methods development and validation work will be identified. The students will also study fuel cycle aspects, in particular the impact of transmutation on the repository.

The Workshop will consist of lectures, computer demonstrations and 'hands-on' exercises. The participants will also be invited to make short presentations of their own research activity, and/or of topics of interest that emerged during the Workshop. The selection of the presentations will be done during the Workshop, based on class discussion and general manifestation of interest.

Scientists and engineers from all countries that are members of the UN, UNESCO or IAEA can attend the Workshop. They should hold a university degree in nuclear physics, nuclear engineering chemistry or related subjects and preferably have several years of professional experience in activation analysis. As the activity will be conducted in English, participants should have an adequate working knowledge of this language. Although the main purpose of the Centre is to help scientists from developing countries, graduate students and post-doctoral scientists from developed countries would equally benefit from the Workshop and are encouraged to apply.

As a rule, travel and subsistence expenses of the participants should be covered by their home institutions. However, limited funds are available for some participants who are nationals of, and working in, a developing country and who are not more than 45 years old, to be selected by the Organizers. Travel expenses will be granted only in exceptional cases. Every effort should be made by candidates to secure support for their fare (or at least half-fare) from their home country. It is stressed that participants whose travel expenses are paid by ICTP are required to attend the entire



in cooperation with

International Atomic Energy Agency

DIRECTOR

ALEXANDER STANCULESCU (International Atomic Energy Agency, IAEA, Vienna, Austria)

LOCAL ORGANIZER

BRIAN STEWART (Abdus Salam ICTP, Trieste)

R&D TOPICS

General concept and system studies

High power accelerators

Spallation target

Sub-critical core

course. There is no registration fee for attending the Workshop.

Application forms for the Workshop can be found on the Web server of ICTP at: http://cdsagenda5.ictp.trieste.it/full_display.php?smr=0&ida=a04210

The closing date for receipt of applications for participation is 15 June 2005.

Please complete and sign the application form and send it by fax or post to:

Technology and Applications of Accelerator Driven Systems (ADS) (c/o Elizabeth Brancaccio) the Abdus Salam International Centre for Theoretical Physics Strada Costiera 11 34014 Trieste, Italy

If sending an application by e-mail please save and send file attachments in PDF

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Fuel development

Partitioning

Fuel cycle studies

DEADLINE 15 JUNE 2005

February, 2005