

30 years activities of SATIF

Hideo Hirayama
KEK and NRA Japan

Objectives of the SATIF meetings

- to promote the exchange of information amongst experts in the field of accelerator shielding and related topics;
- to identify areas where international co-operation can be fruitful, and recommend actions with strong need for international work on theoretical models, experimental work and benchmarking;
- to carry on a programme of work in order to achieve progress in specific priority areas;
- to present and assess achievements on actions agreed upon previously.

Sessions at the SATIF

- Each meeting had 6 to 8 sessions.
- Session titles varied from meeting to meeting, but all meetings included sessions on the following topics:
 - Source terms and related data
 - Benchmarking
 - Status of code and data libraries
- These sessions are closely related to the objectives of SATIF.

Source terms and related data

- The source term is data that plays an important role in the shielding calculations.
 - Thin target measurements
 - Thick target measurements
 - Deep penetration measurements
 - Photonuclear data
 - Forward bremsstrahlung yields
 - Neutron attenuation length
 - Activation cross section data
 - etc.
- At each meeting, new results were presented
- Collected experimental data are also used as benchmark experimental data

Source terms and related data

- Prof. Nakamura presented the summarized experimental data up to 2008 on energy and angular distributions of neutrons produced from thick target of various materials bombarded by protons, deuterons, He and heavier ions having a wide range from MeV to GeV at SATIF-10 (2010).
 - “Production of neutron and spallation products by high-energy particle beams”
 - Thick target yields by proton
 - Thick target yields by deuterons
 - Thick target yields by He and heavier ions
 - Moving-source model of thick target neutron yields
 - Spallation products production cross section
 - $^{11}\text{C}+\text{Cu}$ excitation function
 - Mass-yield distributions
 - Induced activities

Exchange information about experimental facilities in the world

- In order to obtain new experimental values, information on facilities where experiments can be conducted is necessary.
- Collaborative experiments are being conducted in countries around the world through the exchange of information about facilities that can be used for experiments during the summary sessions.
 - Experimental results were presented at the following SATIF meeting.
- **This is also an important role of SATIF.**

Bechmarking

- Experimental benchmark calculation
 - Calculated results for various benchmark experiments were presented at SATIF.
 - These benchmark calculations contributed to improve the codes.
- Intercomparison
 - Intercomparisons between codes were also presented with the simple geometry and common conditions of calculations (material, density, conversion coefficient etc.) to show the effects of models or data used.
 - Results provide motivation to consider models and data.

Status of code and data libraries

- At each meeting, recent progress of various codes were presented.
- These were very useful places to hear the activities about each code from the developers directly.
- Exchange of information about the cross section data and data libraries were also important for radiation shielding calculations.

To advance international collaboration

- During 30 years, SATIF performed useful results in these fields.
- However, there are many challenges that need to be resolved.
- In order for SATIF to fulfill its original role, the following efforts are necessary:
 - Clarifying actions to treat at SATIF as for joint activities
 - Decide on the person in charge
 - Establish a mechanism to share data and issues with SATIF participants
 - Report progress at next meeting
- Referring to the executive summary at each meeting

Accelerator Shielding Handbook

- Agreed at SATIF-6
 - The know-how and experience gathered by the SATIF group over recent years should be synthesized into a handbook.
- At SATIF-7
 - The visibility of SATIF activities needs to be enhanced through: a book on “State-of-the-art on Accelerator Shielding”
- At SATIF-9
 - The editors of handbook were designated among those SATIF members having editing experience: P. Vaz and Nikolai Mokhov and a number of coordinators and authors.
 - The agreed upon structure of the handbook is provided.
- At SATIF-10
 - Some contributions have been provided, but much still has to be written.
 - It has been agreed to look for a person who has sufficient available time to solicit the missing contributions to the various chapters and take up on the editing work.
- Unfortunately, there has been no progress since SATIF-11.

handbook.pptx

SATIF more detail

- History of SATIF
 - Please see "Thirty Years of SATIF Workshops"
- Activities of SATIF
 - Please see "30 years activities of SATIF from 1994 to 2024 Executive summary at each meeting"
 - If you want to know detail, please see "Proceedings of SATIF" in NEA web site
 - https://www.oecd-nea.org/jcms/pl_61631/workshops-on-shielding-aspects-of-accelerators-targets-and-irradiation-facilities-satif