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D7.2 – OVERVIEW OF THE “INTERNATIONAL WORKSHOP ON ACCELERATOR  
OPERATOR AND MANAGEMENT”

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*REFERENCES AND APPLICABLE DOCUMENTS*

[1] Proceedings of the ENSAF workshop (2016)

<http://indico.ific.uv.es/indico/conferenceDisplay.py?ovw=True&confId=2824>

*LIST OF ACRONYMS AND ABBREVIATIONS*

ENSAR2	EUROPEAN NUCLEAR SCIENCE AND APPLICATION RESEARCH 2
ENSAF	European Network of Small-scale Accelerator Facilities
CNA	Centro Nacional de Aceleradores (U. Sevilla, J. Andalucía, CSIC), Sevilla, Spain
CMAM	Centro de Microanálisis de Materiales (U. A. Madrid), Madrid, Spain.
NCSR D	National Centre for Scientific Research Demokritos, Athens, Greece.
NUPECC	Nuclear Physics European Collaboration Committee
IAEA	International Atomic Energy Agency

### *EXECUTIVE SUMMARY*

The ENSAF workshop aims to establish links of the small European accelerator facilities, which participate in the European project ENSAR2, along with other key small European facilities. The objective is to coordinate the efforts to contribute to the objectives of the ENSAR2 project, which are mainly carried out in large-scale European facilities.

The workshop includes an overview of all the laboratories present, done by the Directors; technical presentations on the accelerators by the accelerator operator/engineers, and presentations on selected topics showing the relevance of small accelerator research for the large facilities, which can be done by key scientists.

The workshop also envisages a round table on accelerator management, a round table on accelerator operation and a round table on synergies between small and large facilities, and training opportunities.

### *INTRODUCTION*

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### *SECTION 1 ORGANISATION*

ENSAF meeting, CNA Sevilla, October 19-21, 2016

Organising committee: S. Harissopoulos (NCSR), A. Zucchiati (CMAM) and J. Gómez Camacho (CNA).

Local committee (CNA): J. Alcalde, M.A. Seller, B. Fernandez, M.C. Jiménez, J.M. López, F.J. Garcia, S. León and J. Gómez-Camacho.

## *SECTION 2 PARTICIPANTS*

The meeting had 36 participants from 11 small-scale facilities in Europe:

RBI, Zagreb, Croatia.

NPI, Rez, Czech Republic.

ATOMKI, Debrecen, Hungary.

IST, Lisboa, Portugal.

JSI, Ljubljana, Slovenia.

CMAM, Madrid, Spain.

RUBION, Bochum, Germany.

Fysisk Inst, Oslo, Norway.

NCRSD, Athens, Greece.

INFN, Legnaro, Italy.

CNA, Sevilla, Spain.

## *SECTION 3: ELECTRONIC PROCEEDINGS*

There were 28 oral presentations, 3 round tables and 4 posters. The electronic proceedings of the conference containing the programme, participants and presentations are available at:

<http://indico.ific.uv.es/indico/conferenceDisplay.py?ovw=True&confId=2824>

The main conclusions of the workshop were summarised at the three round tables.

## *SECTION 4: MINUTES FROM THE ROUND TABLE ON “ACCELERATOR MANAGEMENT”*

The ENSAF coordinator, S. Harissopulos, described the objectives of ENSAR2 and the network ENSAF. He invited the facilities that were not formally part of ENSAR to join, through a letter to the coordinator and co-coordinator. The participants agreed on the timeliness for a meeting of small-scale facilities, focused on the Nuclear physics research and applications.

The presence of the small-scale facilities in the NUPECC long-range plan was discussed. The participants agreed on a text, which outlined the key ideas that should appear in the NUPECC recommendation, which could be refined

by the NUPECC members present in the meeting (S. Harissopulos, E. Alves and J. Dobes). The proposed text was the following:

*NUPECC strongly supports the nuclear physics research in the small-scale facilities (national facilities and university laboratories) mentioned in this report. They contribute to the development of instrumentation and techniques necessary for the basic research carried out in large-scale facilities. They have a key impact in the nuclear physics applications, as described in this report. They finally are crucial for the training of the new generation of scientists and technicians.*

*NUPECC recommends that the national institutions responsible for the small-scale facilities cover adequately their personnel needs, allowing for generational replacements, and providing key staff with stable positions.*

*NUPECC recommends that the EU provides the adequate channels to fund the transnational access to the small-scale facilities, as well as the personnel mobility between these, and with large-scale facilities. Transnational access and personnel mobility increase the excellence of the small-scale facility, because they set challenges to local scientists and technicians, and it is the most efficient way of transferring skills.*

These recommendations should be completed with a few (3-6) pages report of all the facilities involved. S. Harissopulos agreed to send a draft to be revised by the laboratory representatives present.

#### *SECTION 5: MINUTES FROM THE ROUND TABLE ON "ACCELERATOR, TECHNICAL TRAINING AND COOPERATION"*

It was first of all underlined how the morning and afternoon sessions on "Technical operation of accelerators" demonstrated not only the high quality of technical competence that can be found in all the ENSAF partner institution but, most importantly, that the network shares, beyond the main research lines, also a large amount of technical topics. The network has developed, as a whole, a high potential for assuring that the facilities are maintained at the forefront of technology and techniques and for providing solutions to critical problems in small accelerators operation and maintenance (e.g., the problem of devices obsolescence). The network has as well the capability to transfer knowledge at the highest level both horizontally (to the other partners) and vertically (to the next generation of small accelerator technicians).

To exploit this potential several possible actions have emerged from the debate. The creation of a forum for exchanging information and offering suggestions and recommendations for the accelerators operation or help in cases of failure, repairs, and modifications would be easy to put in practice, is practically costless and absolutely useful to the community. One very important initiative is to promote from the network the regular organisation of a symposium for the personnel involved with electrostatic particle accelerators in Europe, something that has worked very well in other geographical contexts. The network partners may well afford, already, the organisational cost from their own budgets and think to launch the symposium, with representation of two technicians per laboratory, in the very near future. The creation of an official association of low-energy European accelerators, the active role of NUPECC and ENSAR2, might give further strength to the initiative and assure funds for the establishment of the symposium as an annual event with participation larger than the ENSAF network. Finally, it has been recommended that ENSAF should fund, within the budget limits, some technical personnel short-term exchange, associated with the solution of technical problems in a participating laboratory. All the actions discussed can be put into being even independently one from another, being clear, however, that

coordination and appropriate timing can enhance substantially the success of each of them and of the whole scheme.

It has also been communicated that an agreement has been reached with international institutions to allow transnational access to ENSAR2 and international large-scale facilities on a reciprocal basis.

*SECTION 6: MINUTES FROM THE ROUND TABLE ON “SYNERGIES BETWEEN SMALL AND LARGE FACILITIES AND TRAINING OPPORTUNITIES”*

Following the contributions of the two sessions on “Selected projects in small accelerators relevant for large-scale facilities”, the following fields of interest were identified:

Radiation hardness tests of detectors: Several facilities had a relevant contribution to radiation tests of different detectors. In particular, the IBIC (Ion Beam Induced Charge) was found very interesting for the future of small facilities. The participation of Zagreb in AIDA2020, as well as the participation of Sevilla and Zagreb in IAEA projects was found very positive, although the funding was very limited. Neutron production, both in reactors and in accelerators was also discussed as a niche for the participation of small accelerators.

Participation in the testing of detector arrays of large facilities: The Madrid and Lisbon facilities contributed to the testing of the CALIFA detector array, which will be installed in FAIR. Synergies between the Rez facility and the Czech contributions to SPIRAL and FAIR were outlined. Debrecen contributed to improvement of beam production in large Japanese facilities. It was agreed that participation of the small-scale facilities in the improvement of large-scale facilities was very important, although often the scientists dedicated to large-scale facilities were not sufficiently aware of the potential of small facilities.

Selected projects to be carried out in large-scale facilities: Several very interesting projects, developed in small-scale facilities, were found to be directly relevant to large-scale ones, and could be carried out in a short time scale. Those included physics cases for stable beams, to be extended to radioactive beams, specific detectors, and special targets. The groups in the meeting that were not directly linked to ENSAF were encouraged to join, by sending a letter of interest to the coordinator. In this way, they could send specific projects that could be selected for ENSAF support.

*CONCLUSION:*

Small-scale facilities are very important for nuclear physics research, especially for instrumentation development, applications and training of researchers and technicians. They presently suffer from limited funding, insufficient number of personnel with stable contracts and lack of adequate skills in the technical staff to substitute those retiring.

Small-scale facilities require support to exchange personnel, both technical and research, between them and with large-scale facilities. ENSAF, within its limited resources, can contribute to this end.