



European Coordination for Accelerator Research and Development

PUBLICATION

PREPARATION OF A PROPOSAL FOR A EC COFUNDED NETWORK IN THE EUCARD2 PROPOSAL

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DELIVERABLE REPORT

PREPARATION OF A PROPOSAL FOR A EC COFUNDED NETWORK IN THE EUCARD2 PROPOSAL

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Delivery Slip

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1. EXECUTIVE SUMMARY

A deliverable of the European Network for Novel Accelerators (EuroNNAc) calls for preparation of a proposal for a EC cofunded network in EuCARD2, due M33 (December 2011). This goal was achieved. The EuroNNAc2 proposal in EuCARD2 was prepared, carried by three coordinating institutes (DESY, ERN, Ecole polytechnique) and supported by the 50 institutes associated to this network.

It is hoped that the second phase of the EuroNNAc network will allow advancing the state of novel accelerators close to operational readiness.

2. FUTURE PLANS / CONCLUSION / RELATION TO OTHER EUCARD WORK

Future plans of EuroNNAc call for the second yearly meeting of the network and preparation of EuroNNAc2.

3. EXCERPT FROM THE FP7 EUCARD2 PROPOSAL

WP7: Novel Accelerators (EuroNNAc2)

The European Network for Novel Accelerators EuroNNAc2 aims at federating the significant European effort in plasma-based accelerators in order to prepare a roadmap for an efficient use of this novel technology in full-scale accelerators.

The field of novel, plasma-based accelerators has seen steep progress over the last years. At present, bunches of 1×10^9 electrons are generated and accelerated to 1 GeV with laser-driven plasma accelerators. The beams have a 1% energy spread, normalized emittances around 10 mm-mrad, a bunch length of 1.5 fs and are generated at several university-size laboratories. In parallel, beam driver technologies (e-beam or p-beam) for plasma structures are being developed and tested. For example, e-beam driven plasma accelerators have demonstrated an absolute energy gain of 30 GeV for electrons. The EuroNNAc2 network aims at putting the different technologies together, transferring knowledge to industry, comparing its advantages and disadvantages, defining an optimal combination of technologies and describing a roadmap towards operational accelerators with first use cases (one or several pilot facilities).

EuroNNAc2 is a continuation of the EuroNNAc network that was founded in 2011 with minimal resources and has encountered strong support and interest in the community. The network is coordinated by the three partner labs CERN, Ecole polytechnique and DESY. The network is formed by a large number of associated institutes, organizations and committees. EuroNNAc2 has an official participation of presently 38

European and 13 international (outside Europe) associate partners. Discussions are not finalized yet with 4 additional associated partners (listed in slanted style below). In addition to the entities listed below, EuroNNAc2 is also connected to FP7 laserlab and TIARA.

Work package number	7	Start date or starting event:				M1
Work package title	Novel Accelerators (EuroNNAc2)					
Activity Type	COORD					
Participant number	1	7	11			
Participant short name	CERN	CNRS	DESY			
Person-months per participant:	4	4	4			

Objectives

Task 7.1: Coordination & Communication

- Coordinate and schedule network tasks
- Monitor work progress and inform the project management and participants within the network
- Follow up the WP budget and use of resources

Task 7.2: Scientific goals and programme

- Define scientific goals for various possible applications of plasma acceleration
- Define a coherent European research and test program
- Define a distributed test facility and a first pilot facility
- Prepare common reference standards

Task 7.3: Organisation, strategy and funding

- Develop an efficient organization
- Define an optimal strategy towards operational advanced accelerators
- Discuss funding schemes for long-term R&D efforts

Task 7.4: Communication, training and technology transfer

- Organize conferences and workshop to help an optimal communication
- Promote technology transfer and collaboration with industry and help in training of experts

Description of work

Task 7.1: Coordination & Communication

The activities of this task are for the work package coordinators [CERN, EP and DESY] to oversee and co-ordinate the work of all other work package tasks, to ensure the consistency of the work according to the project plan and to coordinate the WP technical and scientific tasks with tasks carried out by the other work packages when relevant. The coordination duties also include the organization of WP internal steering meetings, the setting up of proper reviewing, the reporting to the project management and the distribution of the information within the WP as well as to the other work packages running in parallel. The task also covers the organization of and support to the annual meetings dedicated to the WP activity review and possible activity workshops or specialized working sessions, implying the attendance of invited participants from inside and outside the consortium.

Task 7.2: Scientific goals and programme

Sub-task 7.2.1. Goals and Requirements. Develop goals from photon science and particle physics for advanced e-beam accelerators, including timeline. 5y, 10y, 20y goals and perspectives.

Sub-task 7.2.2 Technical R&D. Describe coherent programme for research on novel e-beam accelerators. What are the main components of this programme?

Sub-task 7.2.3 Ultimate reach. Investigate the ultimate energy and intensity reach with advanced accelerators.

Sub-task 7.2.4 Standards. Define reference measurements to qualify facilities for photon science and/or particle physics, including definition of standards.

Sub-task 7.2.5 Theory and Simulations. Foster inter-disciplinary work on theory and simulations, bringing together plasma, laser and beam models.

Task 7.3: Organisation, strategy and funding

Sub-task 7.3.1. White paper European strategy. Produce a white paper that defines a coherent European strategy for advanced accelerator R&D, maximizing synergy between different labs and projects.

Sub-task 7.3.2. Distributed Accelerator Test Facility. Create framework for open facilities. EuroNNAc2 to describe and further develop coherent network of test facilities, document capabilities, review requests, discuss work share. “Distributed accelerator test facility for photon science and particle physics”. The results will feed into the work of TIARA.

Sub-task 7.3.3. Pilot facility(ies). Vision on the time-scale of one or few centralized “big” facilities, beyond present projects. From “distributed test facility” to a “pilot e-beam facility”. Pilot facility runs 24h 7/7 to produce agreed e-beam. What does “big” mean? Beam parameters? How many? How to split beam time for synchrotron radiation, medical applications and High Energy Physics applications? The results will feed into the work of TIARA.

Sub-task 7.3.4. European proposals and contact to EU. Ask FP7/8 support for a “distributed open test facility”, including support for beam/laser time for users. Use also LaserLab opportunities. Prepare FP8 proposal for one or several pilot facilities.

Sub-task 7.3.5. Funding mechanisms Propose adequate funding mechanisms to support university-based accelerator research with long-term scientific benefits.

Task 7.4: Communication, training and technology transfer

Sub-task 7.4.1. Technology Transfer. Foster transfer of technology between communities and with industry.

Sub-task 7.4.2. Advanced Accelerator School. Creation of a “European School: From Conventional to Novel Accelerators”, linked to CAS or other series.

Sub-task 7.4.3. Training. Define training needs for students and specialists in advanced accelerator research. Propose training structures to address these needs.

Sub-task 7.4.4. Advanced Accelerator Conference. Evaluate the need for a European Advanced Accelerator Conference. Propose a scheme compatible with existing conferences.

Deliverables

D7.1.1) EuroNNAc2 web pages available: web pages and collaborative work space for the network is set up and open for work contributions (Task 7.1) [month 3]

D7.1.2) Interim EuroNNAc2 report: The status of the field, outcome of the first workshops, plans for collaborative R&D, agreed standards are documented (Task 7.1) [month 24]

D7.1.3) Final EuroNNAc2 report - a European roadmap: A roadmap to one or several pilot facilities for novel accelerators with first use cases described (Task 7.1) [month 48]

Milestone name	Work package(s) involved	Expected date	Means of verification
EuroNNAc2 2013 workshop	Task 7.1 (7.2, 7.3 and 7.4 will also contribute)	M12	Web page for workshop
EuroNNAc2 2014 workshop	Task 7.1 (7.2, 7.3 and 7.4 will also contribute)	M24	Web page for workshop
EuroNNAc2 2015 workshop	Task 7.1 (7.2, 7.3 and 7.4 will also contribute)	M36	Web page for workshop
EuroNNAc2 2016 workshop	Task 7.1 (7.2, 7.3 and 7.4 will also contribute)	M48	Web page for workshop