I.FAST

Innovation Fostering in Accelerator Science and Technology

Horizon 2020 Research Infrastructures GA n° 101004730

Governing Board

Transfer of EC funding between Beneficiaries and accession of new Partners for the needs of the I.FAST Innovation Fund

Document identifier:	I.FAST-GB-001-2023
Action to be taken:	For approval by the Governing Board
Voting Procedure:	By electronic voting: 2/3 majority (42 out of 63 votes)
Issued by:	Project Coordination Office
Date:	16 January 2023

	Name	Partner	Date
Prepared by	M. Losasso (WP4 Coordinator)	CERN	13/01/2023
Approved by	M. Vretenar (Project Coordinator)	CERN	16/01/2023
Endorsed by	J.M Perez (Governing Board Chairperson)	CIEMAT	17/01/2023

1. Action required

The Governing Board members are invited to approve the redistribution of the EC funding from CERN to the 9 I.FAST Beneficiaries that will execute the projects approved by the Evaluation Board of the I.FAST Innovation Fund (IIF), and the accession of 4 new Partner Organisations that will participate in the execution of the Projects.

2. Background information

The I.FAST Innovation Fund (IIF) is a competitive call to support new activities in the second part of the I.FAST Project, aimed at seed-funding new initiatives in the thematic areas of I.FAST with an impact on the sustainability of particle accelerator technologies. The IIF is part of I.FAST WP4, described in the Work Plan Annex I, and funded with 1 M€ EC contribution that was attributed to CERN waiting for the selection of the IIF Projects.

The Governing Board on 2 May 2022 has approved the timeline of IFF and the composition of the Evaluation Board, as well as the IIF call documentation, including the criteria for eligibility, selection, and award of the projects.

The Call for Proposals was opened on 4 May 2022 and closed on 15 September 2022. At that time, 18 projects had been submitted. One project was considered not eligible, and the other 17 projects have been evaluated by a team of 10 evaluators. The composition of the Evaluation Board is given in Appendix 1; possible conflict of interest had to be declared and one evaluator declined to assess 2 projects for reason of perceived conflict of interests. The scoring of the projects has been independently carried out by each Evaluator, with the final score computed as the average of the single scores, according to a predefined scoring model to respect the principles of independence, equality of treatment and transparency.

On 30 November 2022 the first 10 scored projects were invited to make a presentation at CERN and to answer questions from the Evaluation Board. Following the second round of evaluation, 8 projects were eventually selected for funding. The selected projects are listed in Appendix 2.

On 16 December 2022 the Governing Board of the terminated ARIES Project approved by electronic vote the transfer of 243 k€ of unused ARIES budget to CERN to be used for the I.FAST Innovation Fund, to support additional projects beyond the I.FAST allocation of 1 M€. The total funding for the IIF is therefore 1.243 M€.

3. Budget transfers required to support the awarded projects of the I.FAST Innovation Fund

The budget requests by the 8 selected Projects are reported in the following Table, divided in budget for “Beneficiaries”, institutions already in the Consortium, and for “Partners”, new institutions that will join the Consortium as “Partner Organisations”. Please note that the order of Projects in the Table does not correspond to their score.

Name	Institute	kEUR Budget beneficiary	kEUR Budget partner	Total
1. PM for klystron	CERN	15		115
	ELYTT	100		
2. HIGHEST	CERN	10		160
	CSIC		50	
	Ceraco		100	
3. FE cathode	PSI	100		200
	VDL	100		
4. KAIO	CNRS	180		200
	CNR	20		
5. SSPA driven CFA	UU	200		200
6. msec flash	INFN	40		160
	HZDR		110	
	Piccoli	10		
7. AM for ion source	INFN	75		100
	CERN	25		
8. AM vacuum chambers	RHP	75		100
	SBI		25	
TOTALS		**950**	**285**	**1235**

The following methodology is proposed for allocating the resources required to execute the IIF Projects:

- The budget requested by institutions that are already I.FAST Beneficiaries will be transferred by increasing their EC contribution for the amount corresponding to their IIF budget. They will have to claim this expenditure to the Commission together with other I.FAST costs.
- The institutions that are not I.FAST Beneficiaries will join the Consortium as Partner Organisations. Their IIF budget will be transferred directly by CERN, using the additional allocation of 243 k€ and 42 k€ from CERN matching funds.
- The difference between the available IIF funding and the total budget requested by the eight Projects will be used to finance Workshops and reporting meetings of the IIF Projects.

Based on this methodology and on the Table above, we ask the Governing Board to approve the following transfers of EC contribution:

Transfer from	Transfer to	Amount	Description
CERN	ELYTT	100,000.00 €	Project 1
	PSI	100,000.00 €	Project 3
	VDL	100,000.00 €	Project 3
	CNRS	180,000.00 €	Project 4
	CNR	20,000.00 €	Project 4
	UU	200,000.00 €	Project 5
	INFN	115,000.00 €	Project 6 + Project 7
	PICCOLI	10,000.00 €	Project 6
	RHP	75,000.00 €	Project 8
Total		900,000.00 €	

Considering these transfers, the Maximum grant amount of the 10 beneficiaries involved in the IIF redistribution is updated to the following amounts:

	Max grant amount (GA Annex 2)	Amount to be redistributed for the IIF	Corrected Max grant amount
CERN	2,930,837.50 €	- 900,000.00 €	**2,030,837.50 €**
ELYTT	89,906.25 €	+ 100,000.00 €	**189,906.25 €**
PSI	273,687.50 €	+ 100,000.00 €	**373,687.50 €**
VDL-ETG	262,000.00 €	+ 100,000.00 €	**362,000.00 €**
CNRS	333,875.00 €	+ 180,000.00 €	**513,875.00 €**
CNR	70,000.00 €	+ 20,000.00 €	**90,000.00 €**
UU	164,500.00 €	+ 200,000.00 €	**364,500.00 €**
INFN	1,015,012.50 €	+ 115,000.00 €	**1,130,012.50 €**
PICCOLI	30,000.00 €	+ 10,000.00 €	**40,000.00 €**
RHP	50,000.00 €	+ 75,000.00 €	**125,000.00 €**

4. Access and funding of new Partner Organisations

In addition to the transfer of budget between Beneficiaries, we ask the Governing Board to approve the access of the following institutions as Partner Organisation of I.FAST, receiving from CERN the funding specified in the following Table.

New Partner	Full name	Country	Amount	Description
CSIC	Consejo Superior de Investigaciones Científicas - Instituto de Ciencia de Materiales de Barcelona https://www.csic.es/en/csic	Spain	50,000.00 €	Project 1
Ceraco	Ceraco ceramic coating GmbH https://www.ceraco.de/contact/	Germany	100,000.00 €	Project 3
HZDR	Helmholtz Zentrum Dresden Rossendorf https://www.hzdr.de	Germany	110,000.00 €	Project 3
SBI	SBI GmbH www.sbi.at	Austria	25,000.00 €	Project 4

5. Conclusions

By voting YES to the electronic poll, the Governing Board members accept the above redistribution of EC Contributions and approve the access of four new Partner Organisations in the Consortium to participate in the IIF activities with the funding specified above.

Annex 1 – Members of the IIF Evaluation Committee

M. Losasso, CERN, WP4 Coordinator, Chair
G. Bisoffi, INFN, WP4 member, appointed by the TIARA Collaboration Board
M. Baylac, CNRS, WP4 member, appointed by the TIARA Collaboration Board
A. Faus Golfe, I.FAST Industry Advisory Board chair
P. Fork, GSI, WP 5 Coordinator
C. Antoine, CEA, WP8 Coordinator
R. Geometrante, Kyma SpA, representative of I.FAST industry
Z. Melhem, Oxford Quantum Solutions Ltd, representative of non-I.FAST industry
M. Morandin, INFN, WP3 Coordinator
M.Vretenar, CERN, I.FAST Coordinator

Annex 2 – Projects selected to be funded by the I.FAST Innovation Fund

1 - **Permanent magnet solenoid for High efficiency Klystron**
Design and build a permanent magnet solenoid for an available klystron. By increasing efficiency of the klystrons, it promises to reduce the operational costs of any accelerator together with the associated carbon footprint.
Institutes: CERN, Elytt. Requested total budget 115k€

2- **High-Temperature High-Gradient Superconductors**
Develop and optimize a 3D coating technology and demonstrate its scalability to make practical RF high power devices. It promises an improvement in Q factor resulting in relevant energy savings for accelerators
Institutes: CERN, CSIC, Ceraco. Requested total budget 160k€

3- **Field Emission Cathode for a Travelling-Wave RF gun for High Brightness Beams**
Develop a versatile high brightness MeV electron source based on a field emission cathode. The field emission gun's overall footprint is expected smaller than compared to RF photogun and DC thermoionic gun. Consequently, it will have a reduced environmental impact.
Institutes: PSI, VDL. Requested total budget 200k€

4- **KAIO Accelerator**
Industrially develop a cost- efficient and stable high power laser technology in kHz class, apt to be used in radiobiology and NTD applications. It promises to reduce energy requirements for LPA.
Institutes: CNRS, CNR. Requested total budget 200k€

5- **Development of Highly Efficient MW Class Cross Field Vacuum Tube Amplifier for Particle Accelerators Driven by a Solid State Power Amplifier at 750 MHz**
Develop a megawatt class cross-field amplifier (CFA) based RF system for particle accelerator applications. It promises the realization of a CFA with peak RF power of 1 MW at 750 MHz with Efficiency >80%, Gain ~30dB, Duty cycle 0.1 % and PRF 1 kHz
Institutes: UU. Requested total budget 200k€

6-**Millisecond flash lamp treatment for SRF accelerating cavities**
Develop a novel thermal process to improve performances of SC coating by suppressing (reducing) Cu substrate heating. SC resonant cavities operating at higher T than bulk Nb promise to reducing cryogenic power costs by 60%. In addition, FLA is less energy-intensive (20-30) resulting in a reduction of CO2 emissions
Institutes: INFN, HZDR, Piccoli. Requested total budget 160k€

7- **AM applications of refractory metals for ION Source cavities**
Development of new Refractory Metals Alloys specifically Designed for Additive Manufacturing to improve the physical performance of the ion sources (Ta-based and/or Nb- based alloys) or to solve the fabrication defects related to pure metals production. It promises to reduce amount of wasted material and increase process efficiency
Institutes: INFN, CNR. Requested total budget 100k€

8- **Demonstration of additive manufacturing for large and complex shaped vacuum chambers by Plasma Metal Deposition (PMD®)**
Demonstrate the Plasma Metal Deposition (PMD) as AM of a large and complex vacuum chamber geometry. It promises a positive impact on the environmental footprint by reduction of material waste by 30 % and more, reduction of integration steps , reduction of stock material, reduction of lead time
Institutes: RHP, SBI. Requested total budget 100k€