

ARIES TRANSNATIONAL ACCESS APPLICATION FORM

Before completing this form please contact the relevant facility coordinator for a preliminary discussion about the technical feasibility of your proposal.

Contact details can be found [here](#).

For each item refer to **Guidelines for Applications (Annex 1)**.

I. Description of the project/experiment/test

Project Title	ESS High-beta Elliptical Cavity
Project TA Identifier	<i>To be allocated by the ARIES project office</i>
Project Duration	3 months

Please select the facility to which you apply for Transnational access

Type of facility	Access provider	Infrastructure	
Magnet testing	CERN	MagNet	<input type="checkbox"/>
	UU	FREIA	<input type="checkbox"/>
Material testing	CERN	HiRadMat	<input type="checkbox"/>
	GSI	UNILAC	<input type="checkbox"/>
Electron and proton beam testing	KIT	ANKA	<input type="checkbox"/>
	KIT	FLUTE	<input type="checkbox"/>
	CEA	IPHI	<input type="checkbox"/>
	DESY	SINBAD	<input type="checkbox"/>
	STFC	VELA	<input type="checkbox"/>
Radiofrequency testing	UU	FREIA	<input checked="" type="checkbox"/>
	CERN	Xbox	<input type="checkbox"/>
Plasma beam testing	CNRS	LULI	<input type="checkbox"/>
	CEA	LIDyL	<input type="checkbox"/>
	ULUND	LULAL	<input type="checkbox"/>

Project abstract (please write a short summary of the project and its objectives in the box below)

A prototype high-beta elliptical superconducting cavity has been designed and manufactured for ESS. This 704.42 MHz 5-cell cavities has a beta value of 0.86 and the nominal accelerating gradient on the ESS accelerator is 19.9 MV/m at 2 K. The vertical test results of the bare cavity (before helium tank welding) demonstrates that the cavity can achieve the ESS specifications with a factor of 2 of margin on the Q0. The cavity has now been dressed with a helium tank. A prototype power coupler has been designed and manufactured. The power coupler has been conditioned up to 1.1 MW at full ESS duty cycle.

We now want to test the cavity package, with the power coupler installed on the dressed cavity, to validate conditioning and operation under nominal ESS accelerating gradient and power level. In addition we want to measure Q-external of the cavity package.

Project description (1-1,5 page) including:

- **Research or experimental work planned**
- **How the project/experiment/test will benefit from the access to this facility**
- **If relevant, tentative schedule of the use of the facility**

Planned experimental work

- conditioning of the power coupler at room temperature, determine the multipacting regions as function of power level
- conditioning of the power coupler at 2 K, determine the multipacting regions as function of power level
- conditioning of the cavity package
- measure Q-external as function of the power level
- measure dynamic heat load

No other facility is available wherer this measurement can be performed.

The ESS project foresees to start procurement of the high-beta elliptical cavity by December 2017 in order to keep its planning and installation schedule. Therefor it is

important for the project to have a validation of the proper operation of the cavity package and the measured value of Q by November 2017 latest.

The cavity package can be available from July 2017. We estimate that it will take 4 weeks for installation and another 5 weeks for conditioning and test at room temperature and 2 K and finally 3 weeks for warm-up and removal of the cavity.



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II. 2-3 relevant publications of the user group leader

1. F. Peauger et al.,
Progress in the Elliptical Cavities and Cryomodule Demonstrator for the ESS
Linac,
Proc. SRF 2015, TUPB007.
2. F. Peauger et al.,
Status and First Results of Two High Beta Prototype Elliptical Cavities for ESS
Proc. IPAC 2014, WEPRI002
3. C. Arcambal, F. Peauger et al.,
Status of the Power Couplers for the ESS Elliptical Cavity Prototypes,
Proc. SRF 2015, THPB078.

III. Access requested under the TNA programme of ARIES

User group leader	Home institution (Name, Country)	Researcher status¹	Total no. of days	No. of visits
Franck Peauger	CEA Saclay, France	EXP	8	2

List in the following table all users part of the team including those who will not be physically present (remote access users, for these users number of days and number of visits will be 0)

Researchers	Home institution (Name, Country)	Researcher status	Total no. of days	No. of visits
Thibault Hamelin	CEA Saclay, France	EXP	8	2
Guillaume Devanz	CEA Saclay, France	EXP	4	1
Pierre Bosland	CEA Saclay, France	EXP	2	1
Eric Jacques	CEA Saclay, France	TEC	2	1

¹ UND=Undergraduate; PGR=Post graduate researcher; PDOC=Post-doc researcher; TEC=Technician; EXP=Experienced researcher.

4) Comments

☒ We acknowledge the requirements to publish the results (except for SMEs) from the TNA of ARIES in a journal or conference paper or ARIES note

☒ We are aware that all technical aspects of the project/experiment/test including safety and risk hazards need to be discussed with the technical coordinator of the facility concerned

Date

...29/05/2017.....

User Group Leader Name

Franck PEAUGER

Signature



Annex. 1

Guidelines for Application

The Transnational Access programme poses certain restrictions upon the eligibility of users, defined in [Article 16.1 of the Horizon 2020 Grant Agreement](#).

1) Experiment

Indicate the title of the experiment.

The project TA identifier will be assigned to you by ARIES-TA@cern.ch, after the project has been approved.
(e.g. ARIES-MAGNET-2017-01).

Description of the project (max. 1 page)

Describe the scientific and technical aspects of the project. Underline the goal of your project and the specific relevance of your proposal. Add references if necessary.

2) Include a list of 2-3 relevant publications of the user group leader.

3) Access requested under TA Programme

Indicate the researcher's name, the number of days that he/she will spend at the facility and the number of visits to the facility. For remote users, please specify "remote user" in the table.

4) Comments

Add any additional comments you think might be helpful to the User Selection Panel (USP) for the evaluation of your proposal.

For any further information or questions, please contact ARIES-TA@cern.ch

! Note to users:

- The user group leader needs to sign a confirmation of beamtime/irradiation time, at the end of each visit.
 - The user group leader needs to complete a TA summary report.
 - The user group needs to disseminate the results generated under the project.
- All publications should include the following acknowledgement:



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