welcome to the
European Microkelvin Collaboration

CAPACITIES

Report on the Transnational Access Activity carried out within MICROKELVIN

The eligibility of transnational access to a MICROKELVIN TA site implies the submission of the following:

1) The Certification of visit

The form "Certification of visit" must be completed and signed by the access provider in charge of the infrastructure and the leader of the project.

2) A TA project report

The form for the TA project report is contained within this document. It should be completed after project end by the group leader of the project. You must respect the limited number of words specified, longer descriptions will be rejected. Figures/tables may be attached at the end of the document. The document must be submitted in an editable format (doc, rtf).

3) A User group questionnaire

To enable the Commission to evaluate the Research Infrastructures Action, to monitor the individual contracts, and to improve the services provided to the scientific community, each project leader of a user-project supported under an EC Research Infrastructure contract is requested to complete a "user group questionnaire". The questionnaire must be submitted once by each user group to the Commission as soon as the experiments on the infrastructure come to end.

The user group questionnaire is not part of this document and must be completed on-line. It is accessible at:

http://cordis.europa.eu/fp7/capacities/questionnaire_en.html.

► **Please note that any publications resulting from work carried out under the MICROKELVIN TA activity must acknowledge the support of the European Community:**

> **"The research leading to these results has received funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 228464 (MICROKELVIN)."**

.

welcome to the European Microkelvin Collaboration

CAPACITIES

MICROKELVIN Transnational Access Project Report

1. General information

Project number: **Project Title:**	**AALTO33** **Bose-Einstein condensate of magnons as a probe for vortex structures in 3He-B**	
Lead scientist:[1]	**Title:**	Prof.
	First name:	John
	Last name:	Saunders
	Home institution:	Royal Holloway, University of London
Host scientist:[2]	**Title:**	Dr.
	First name:	Vladimir
	Last name:	Eltsov
	Home institution:	Aalto University
Project scientist:[3]	**Title:**	Dr.
	First name:	Lev
	Last name:	Levitin
	Birth date:	03/05/1983
	Passport number:	51N4147602
	Research status/Position:	Postdoctoral Research Assistant
	New User:[4]	
	Scientific Field:	Condensed Matter Physics
	Home institution:	Royal Holloway, University of London
	Is your home institution MICROKELVIN partner?	Yes
	Business address:	Royal Holloway, University of London
	Street: PO Box:	Egham Hill
	City:	Egham, Surrey
	Zip/Postal Code:	TW20 0EX
	Country:	UK
	Telephone:	+44 1778 443493

1 The lead scientist indicated here is expected to participate in the campaign as a user of the infrastructure.

2 The host scientist is supervising the work of the visiting project scientist at the infrastructure.

3 The project scientist is the person who will be visiting the infrastructure.

4 Indicate 'Yes' only if the user has never visited the infrastructure before this specific project, otherwise write 'No'.

	Fax:	**+44 1778 472794**
	E-mail:	**l.v.levitin@rhul.ac.uk**

2. Project information

Please, give a brief description of project objectives: (250 words max)	Bose-Einstein condensates of magnon quasiparticles in magneto-textural traps in superfluid 3He-B provide a sensitive probe for the order-parameter texture and relaxation effects at temperatures below 0.3 Tc. Their applications to studies of quantized vortex lines and other topological defects in superfluid 3He are especially promising. The goal of this project was to extend such studies to complex vortex structures and to prepare for future more detailed research on the vortex-core-bound fermions.
Technical description of work performed: (250 words max)	The relaxation of a magnon condensate in superfluid 3He-B via interaction with a vortex array stabilised by rotation gives insight into the nature of vortex core excitations. The variation of the relaxation rate with time and magnetic field (or the frequency of coherent precession of the magnon condensate spin) was investigated. Technical improvements eliminated delays between measurements in a series of relaxation measurements and increased both the rate at which the measurements can be performed and the amount of data that can be collected within a single day.
Project achievements (and difficulties encountered)**:**[5] (250 words max)	The precision of the measurements of previously observed periodic magnetic field dependence of the relaxation rate was increased. The temporal dependence, which previously was believed to be noise, proved to be oscillations which probably are associated with rotation. The next step is to determine whether the temporal changes can be attributed to small shifts in the period of the magnetic field dependence. When the cryostat rotation velocity is changed abruptly, the relaxation rate ceases to depend on both field and time, but the dependence is recovered later, suggesting that the dependence is related to the presence of a regular vortex array, that undergoes rearrangement after speeding up or slowing down the rotation.
Expected publications and dates:	Article in Physical Review Letters in 2014
Submission date of user group questionnaire:	07/06/2013

Completed Project Reports should be returned to MICROKELVIN Management Office (Sari.Laitila@aalto.fi, Fax: +358 9 47022969).