welcome to the European Microkelvin Collaboration

CAPACITIES

MICROKELVIN Transnational Access Project Report

1. General information

Project number:	**Aalto10**	
Project title:	**Bose-Einstein condensate of magnons in rotating superfluid 3He**	
Project acronym:		
Lead scientist:[1]	**Title:**	Mr.
	First name:	Pierre
	Last name:	Hunger
	Birth date:	18th November 1985
	Research status/Position:	PhD student
	New User:[2]	Yes
	Scientific Field:	superfluid ^{3}He, NMR
	Home institution:	Institut Néel, CNRS Grenoble
	Home institution is MICROKELVIN partner:	**Yes**
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[1] The lead scientist indicated here is expected to participate in the campaign as a user of the infrastructure.
[2] Indicate 'Yes' only if the user has never visited the infrastructure before this specific project, otherwise write 'No'.

2. Project information

Please, give a brief description of project objectives: (250 words max)	The different modes of coherent spin precession have proven to be important tools in the study of the ^{3}He superfluids. The persistent very low temperature magnon mode in the different eigenstates of a specially configured magnetic trap is expected to provide new opportunities to examine the T → 0 limit in 3He-B. It is one of the few powerful measuring methods in this temperature regime. It is, in particular, the dynamics of quantized vortices and the structural features, which affect the zero-temperature dynamics, which are of great current interest generally in condensed matter physics.
Technical description of work performed: (250 words max)	During this one month visit Pierre Hunger will participate in experiments on the rotating cryostat in Helsinki to study the interaction between the Bose Einstein condensate of magnons and the vortices in superfluid ^{3}He. These experiments are closely related to his thesis work on the influence of various parameters (disorder induced by the aerogel, orbital momentum orientation) on the coherent precession phenomena. Particularly, they would be a practical application to the coherent precession modes in superfluid ^{3}He. This stay will also allow Pierre Hunger to discuss and learn about some of the experimental techniques that are at the core of his measurements and that are also used in Helsinki, nuclear demagnetization, nuclear magnetic resonance, etc.
Project achievements (and difficulties encountered)**:**[5] (250 words max)	Mr. Hunger participated in the new type of experiment, proposed early by Yury Bunkov. In the experiment the excited state of Q bal was formatted by CW NMR. Then the CW pumping was off and the indaction decay signal was recorded. The analis of this signal shows, that the excited state without pumping decay to a ground state. The process of this transformation is now under a theoretical studies. In any case the new and very important information about Bose-Einstein condensation of excited states was obtained. The similar experiment in atomic gases was not yet done!
Expected publications and dates:	There is a pioneering result. The article for Phys Rev Letters is now in preparation. The results will be also included to a regular articles and reviews.
Submission date of user group questionnaire:	

Completed Project Reports should be returned to MICROKELVIN Management Office (katariina@neuro.hut.fi, Fax: +358 9 4512969).