UNIVERSITÉ CLAUDE BERNARD LYON 1

DOCTORAL THESIS

Development of a new generation of low-threshold cryogenic detectors for the search of low-mass dark matter and low-energy neutrino physics

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A thesis submitted in fulfillment of the requirements for the degree of Doctor of Philosophy

in the

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Declaration of Authorship

I, Dimitri MISIAK, declare that this thesis titled, " Development of a new generation of low-threshold cryogenic detectors for the search of low-mass dark matter and low-energy neutrino physics " and the work presented in it are my own. I confirm that:

- This work was done wholly or mainly while in candidature for a research degree at this University.
- Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated.
- Where I have consulted the published work of others, this is always clearly attributed.
- Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work.
- I have acknowledged all main sources of help.
- Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself.

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Famous Person or Obscure Reference

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Abstract

Physique et Astrophysique de Lyon
Institut des Deux Infinis de Lyon

Doctor of Philosophy

Development of a new generation of low-threshold cryogenic detectors for the search of low-mass dark matter and low-energy neutrino physics

by Dimitri MISIAK

The Thesis Abstract is written here (and usually kept to just this page). The page is kept centered vertically so can expand into the blank space above the title too...

Acknowledgements

The acknowledgments and the people to thank go here, don't forget to include your project advisor…

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List of Abbreviations

PSD	**P**ower **S**pectral **D**ensity
FID	**F**ully **I**nter**D**igitized

Physical Constants

Speed of Light	$c_0 = 2.997\,924\,58 \times 10^{8}\,\mathrm{m\,s^{-1}}$ (exact)
Boltzmann Constant	$k_B = 1.380\,649 \times 10^{-23}\,\mathrm{J\,K^{-1}}$ (exact)
Elementary Charge	$e = 1.602\,176\,634 \times 10^{-19}\,\mathrm{C}$ (exact)

List of Symbols

T	temperature	K
P	power	W ($\mathrm{J\,s^{-1}}$)
E	energy	J
ω	angular frequency	rad

For/Dedicated to/To my...

Chapter 1

Neutron Measurements at IP2I cryogenic facilty

1.1 Quick presentattion

Hey, there ! Just to let you know that I did the analysis for the neutron measurements. And I also took the data. Yep, with my very own detector called RED80. Its electrodes are a bit of a mess, but I like it very much cause it gave us some very nice results, with nice discrimination and the possibility to see the neutron band.