RICE UNIVERSITY

The Research Project You Have Done for Your Qualification Exam

by

Graduate Student

A Proposal Submitted
in Partial Fulfillment of the
Requirements for

PhD Candidacy

Houston, Texas

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Contents

The main text of the report starts here. The format is rather free. It should be absolutely fine to write something here before the first section.

1   The First Section

Starting with a topic sentence. The first section is probably an introduction section where the background of this research project is introduced. It would be nice to have a little equation:

$$(A, Z) \rightarrow (A, Z + 2) + 2e^- + 2\bar{\nu}_e + Q_{\beta\beta}, \tag{1}$$

no indent here because the equation is not the end of a paragraph but it is not always true. Here what everything mean in the equation should be explained. A figure just like Figure 1 might be helpful for explaining the equation. And a little citation [1] because why not. Now we can have a second equation:

$$(A, Z) \rightarrow (A, Z + 2) + 2e^- + Q_{\beta\beta}. \tag{2}$$

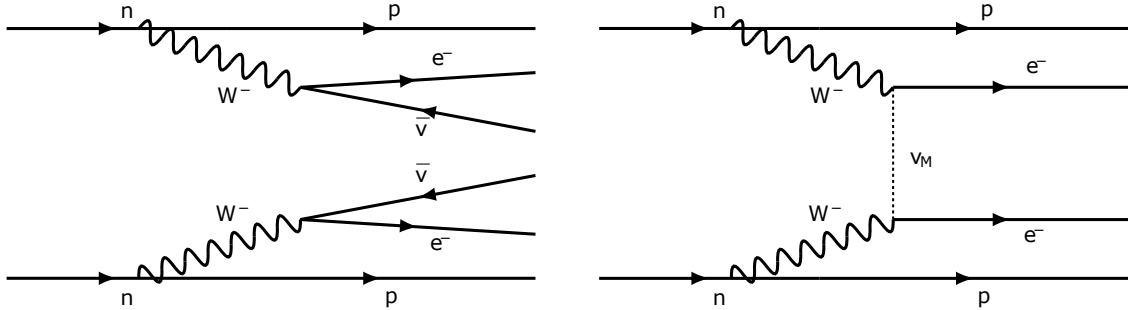This time a new paragraph is started and there is no need to put \noindent at the begining.

Figure 1 : Caption.

1.1   Subsection

Content here.

Table 1 : $T^{0\nu}_{1/2}$ and $\langle m_{\beta\beta} \rangle$ limits (90% C.L.) from selected recent measurements, sorted by the mass number. The $\langle m_{\beta\beta} \rangle$ limits are listed as reported in refereed publications. Adapted form [2]

Isotope	$T^{0\nu}_{1/2}$ ($\times 10^{25}$ y)	$\langle m_{\beta\beta} \rangle$ (eV)	Experiment
^{76}Ge	> 8.0	$< 0.12 - 0.26$	GERDA [3]
	> 1.9	$< 0.24 - 0.52$	MAJORANA DEMONSTRATOR [4]
^{130}Te	> 1.5	$< 0.11 - 0.52$	CUORE [5]
^{136}Xe	> 10.7	$< 0.061 - 0.165$	KamLAND-Zen [6]
	> 1.8	$< 0.15 - 0.40$	EXO-200 [7]

1.2 Another subsection

Content here. And a table (Table 1).

2 The Second Section

Content here.

2.1 Subsection

Content here.

2.2 Subsection 2

Content here.

3 The Third Section

Content here.

3.1 Subsection

Content here.

3.2 One more subsection

Content here.

4 Future Works

Write about research projects that is going to be in a PhD thesis here.

4.1 One project

The first project for PhD thesis.

4.2 Another project

Something else. Change the bibliography style if you do not like it.

References

1. Moe, M. The First Direct Observation of Double-Beta Decay. *Ann. Rev. Nucl. Part. Sci.* **64,** 247–267 (2014).

2. Dolinski, M. J., Poon, A. W. P. & Rodejohann, W. Neutrinoless Double-Beta Decay: Status and Prospects. *Ann. Rev. Nucl. Part. Sci.* **69,** 219–251. arXiv: `1902.04097 [nucl-ex]` (2019).

3. Agostini, M. *et al.* Improved Limit on Neutrinoless Double-β Decay of ^{76}Ge from GERDA Phase II. *Phys. Rev. Lett.* **120,** 132503. arXiv: `1803.11100 [nucl-ex]` (2018).

4. Aalseth, C. E. *et al.* Search for Neutrinoless Double-β Decay in ^{76}Ge with the Majorana Demonstrator. *Phys. Rev. Lett.* **120,** 132502. arXiv: `1710.11608 [nucl-ex]` (2018).

5. Alduino, C. *et al.* First Results from CUORE: A Search for Lepton Number Violation via $0\nu\beta\beta$ Decay of ^{130}Te. *Phys. Rev. Lett.* **120,** 132501. arXiv: `1710.07988 [nucl-ex]` (2018).

6. Gando, A. *et al.* Search for Majorana Neutrinos near the Inverted Mass Hierarchy Region with KamLAND-Zen. *Phys. Rev. Lett.* **117.** [Addendum: Phys.Rev.Lett. 117, 109903 (2016)], 082503. arXiv: `1605.02889 [hep-ex]` (2016).

7. Albert, J. B. *et al.* Search for Neutrinoless Double-Beta Decay with the Upgraded EXO-200 Detector. *Phys. Rev. Lett.* **120,** 072701. arXiv: `1707.08707 [hep-ex]` (2018).