Cherenkov Veto in full GERDA Geometry

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Overview

- Development of our simulations
- Cherenkov veto for the full GERDA-geometry
- Comparision of Toy- and GERDA-geometry
- Outlook
- Conclusion

Development of our simulations

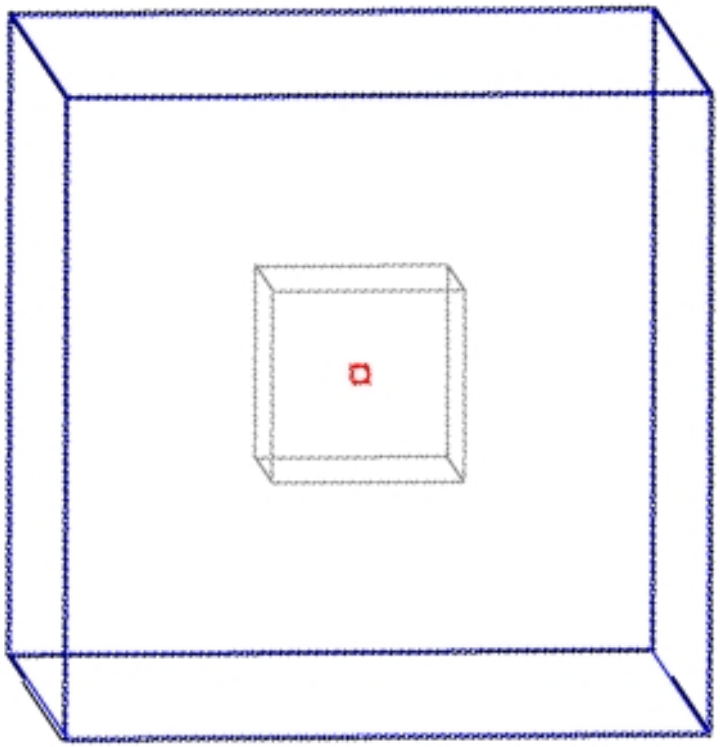
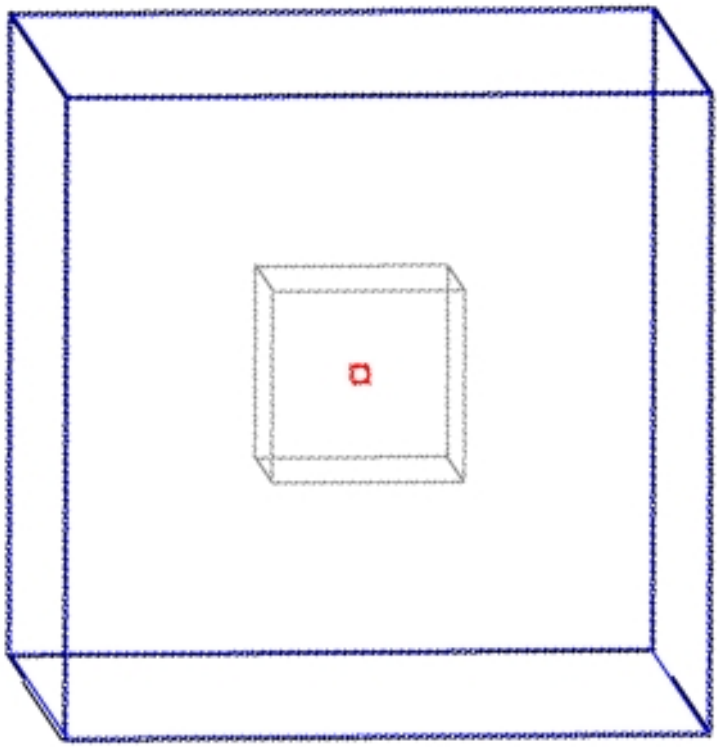


Figure: Toy-geometry

Development of our simulations



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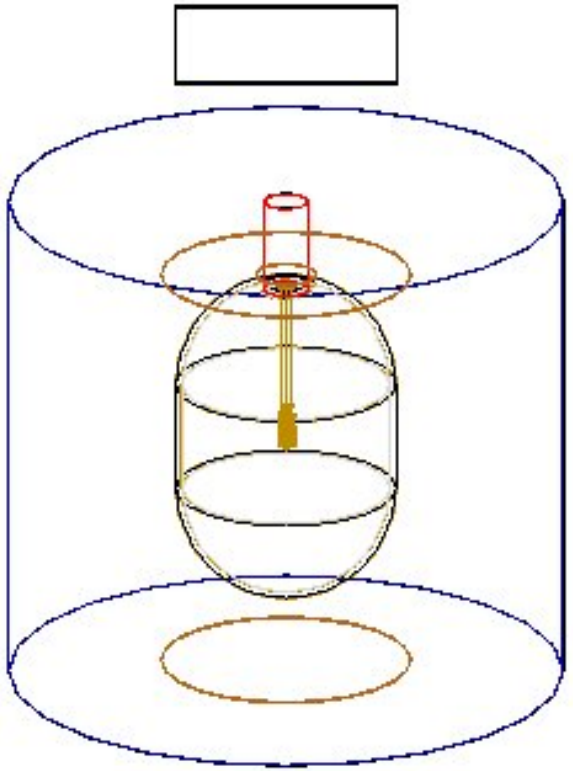

Figure: Full GERDA-geometry

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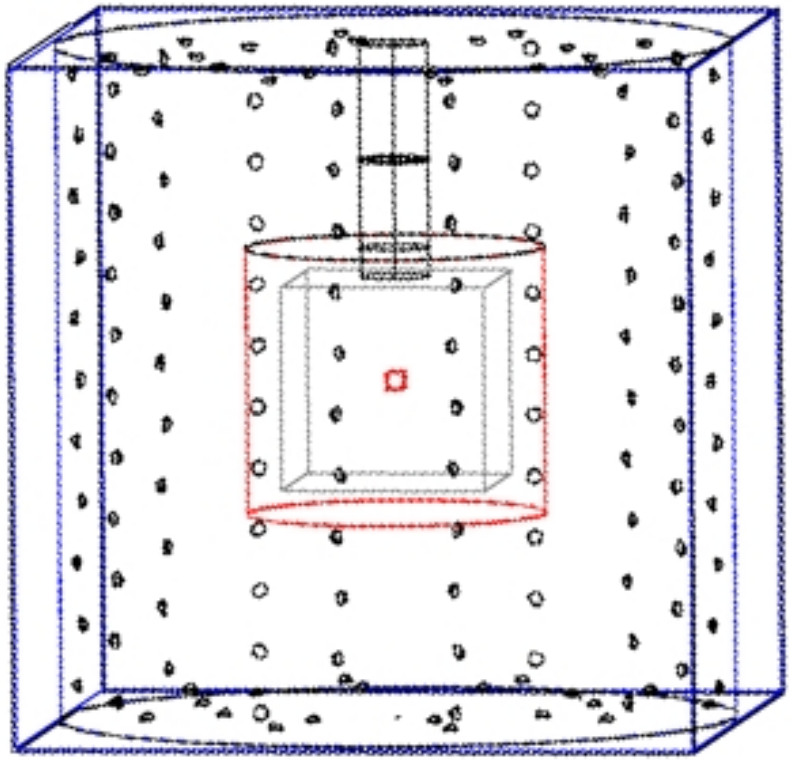

Figure:
Toy-geometry with Cerenkov veto

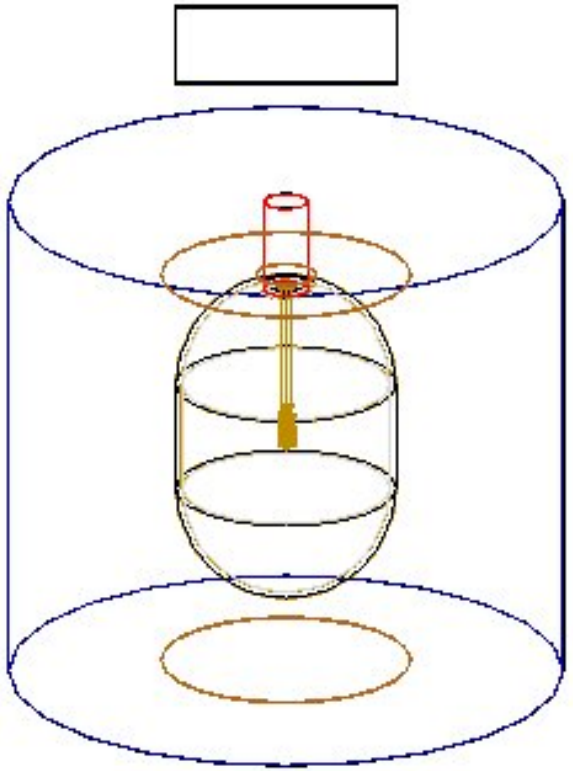

Figure: Full GERDA-geometry

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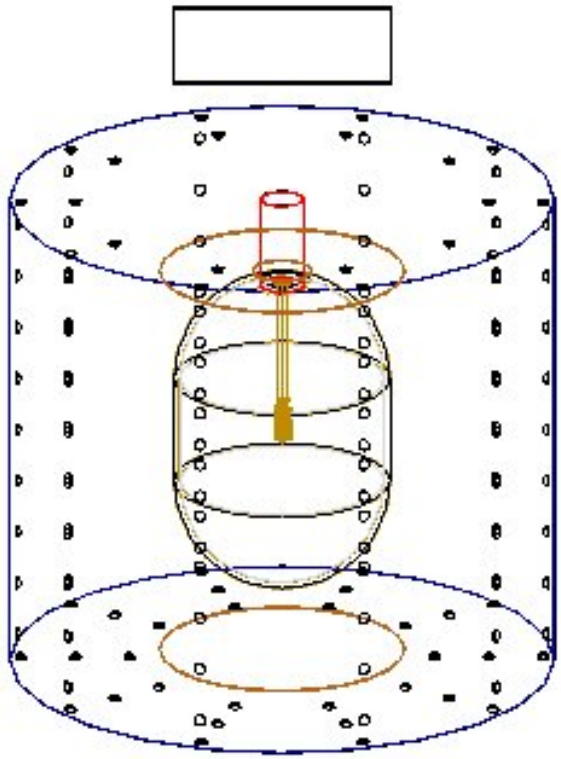
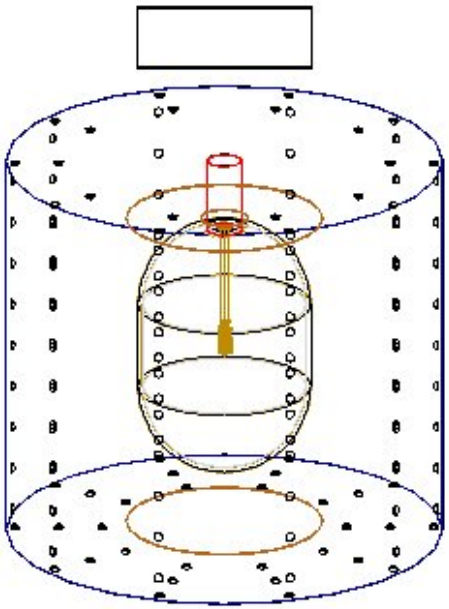


Figure: Full GERDA-geometry with Cerenkov veto

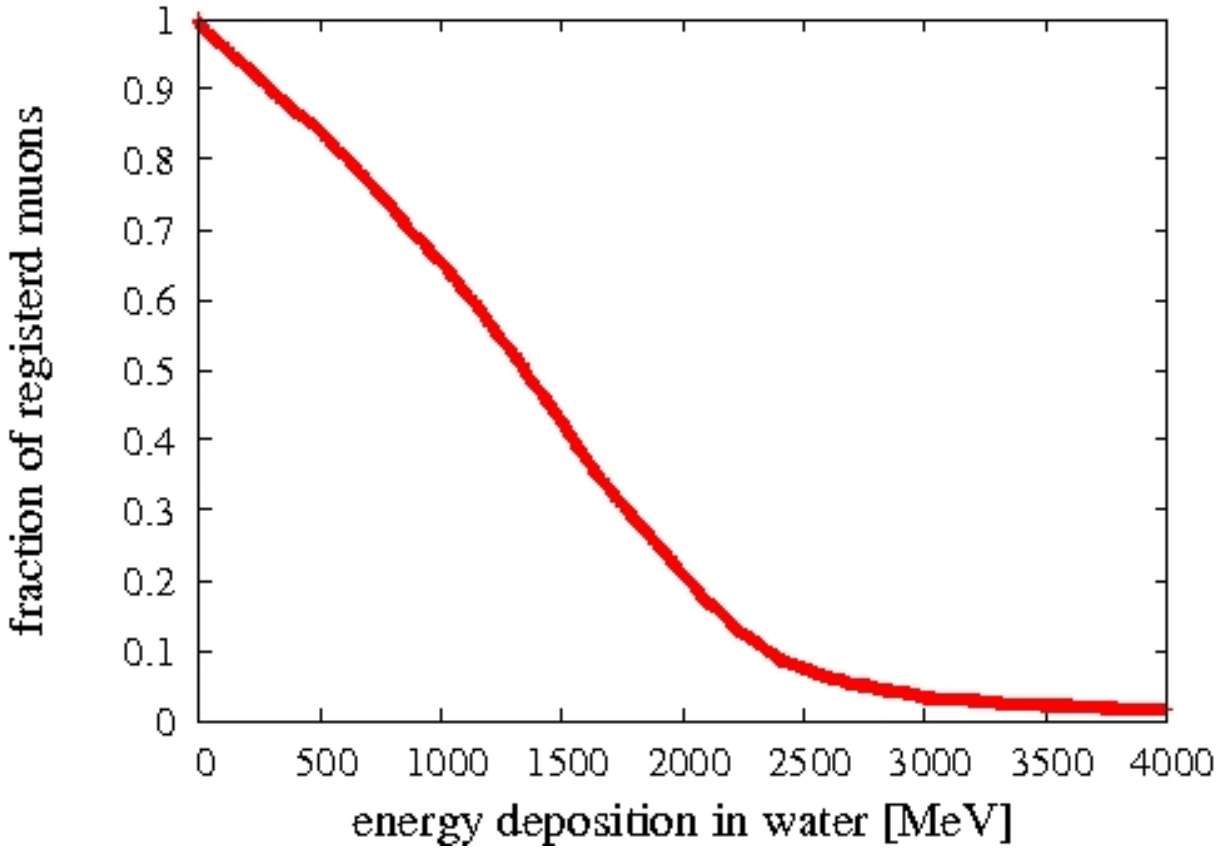
Cherenkov veto for the full GERDA-geometry



- We still are in the test-phase
- First test runs were made, each with 2000 events
- There are still several problems, concerning mainly the output of data
- Nevertheless, there are some results

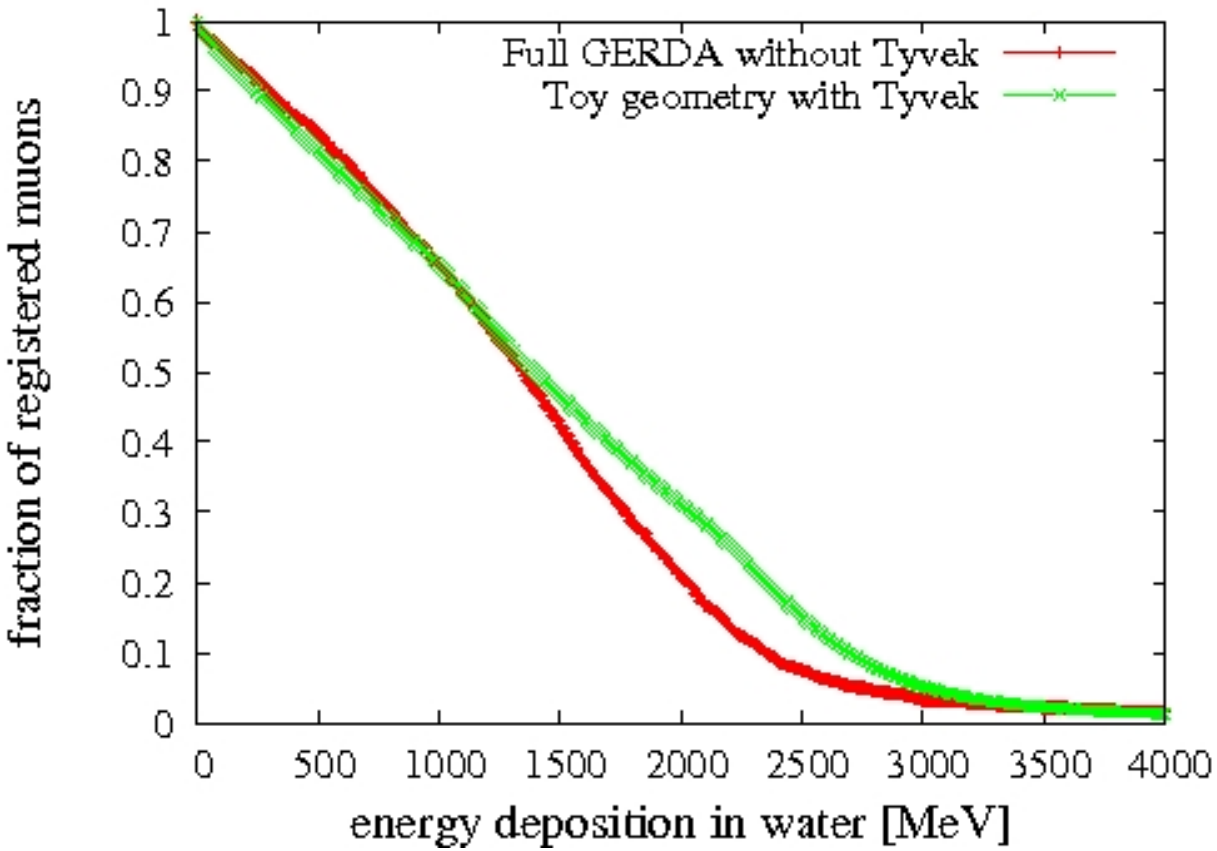
Cherenkov veto for the full GERDA-geometry

Fraction of registered muons over energy deposition in water without Tyvek.



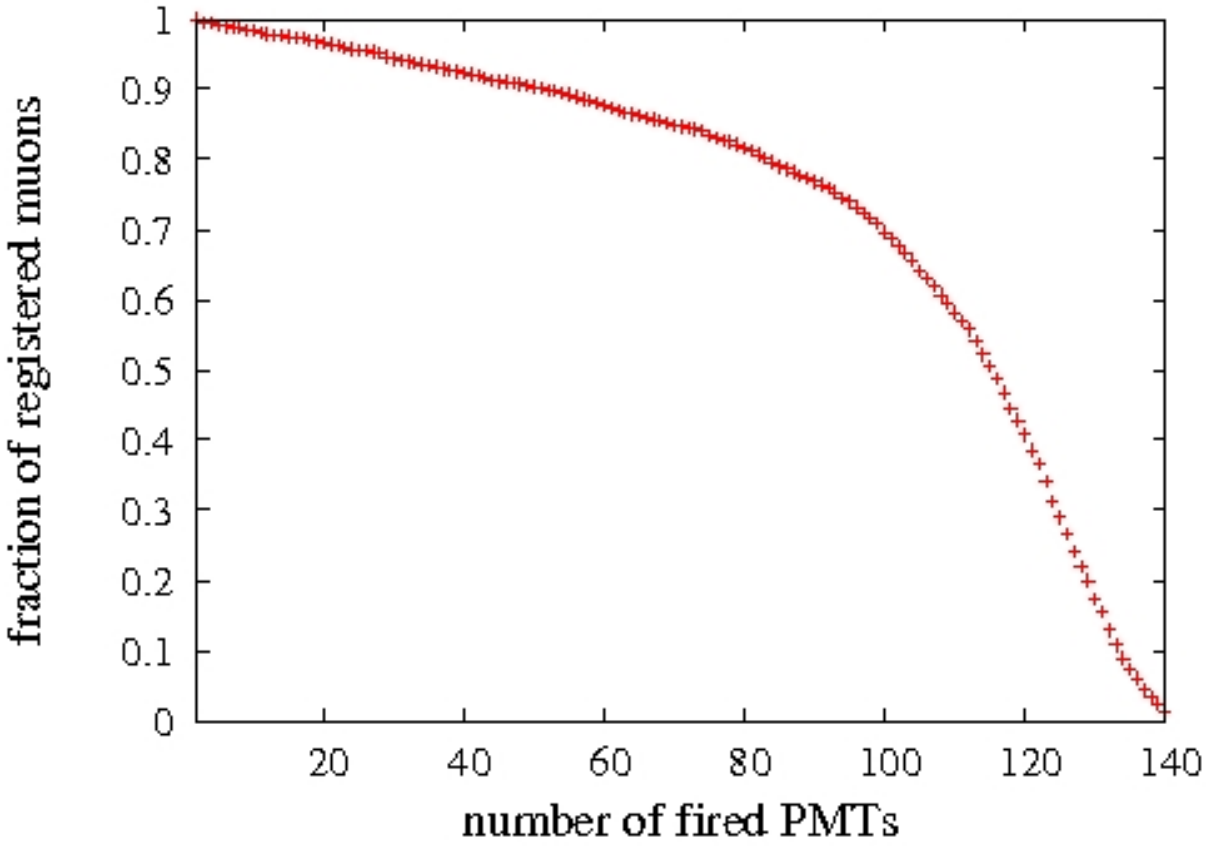
Comparison to Toy-geometry

With Tyvek this is nearly the same.



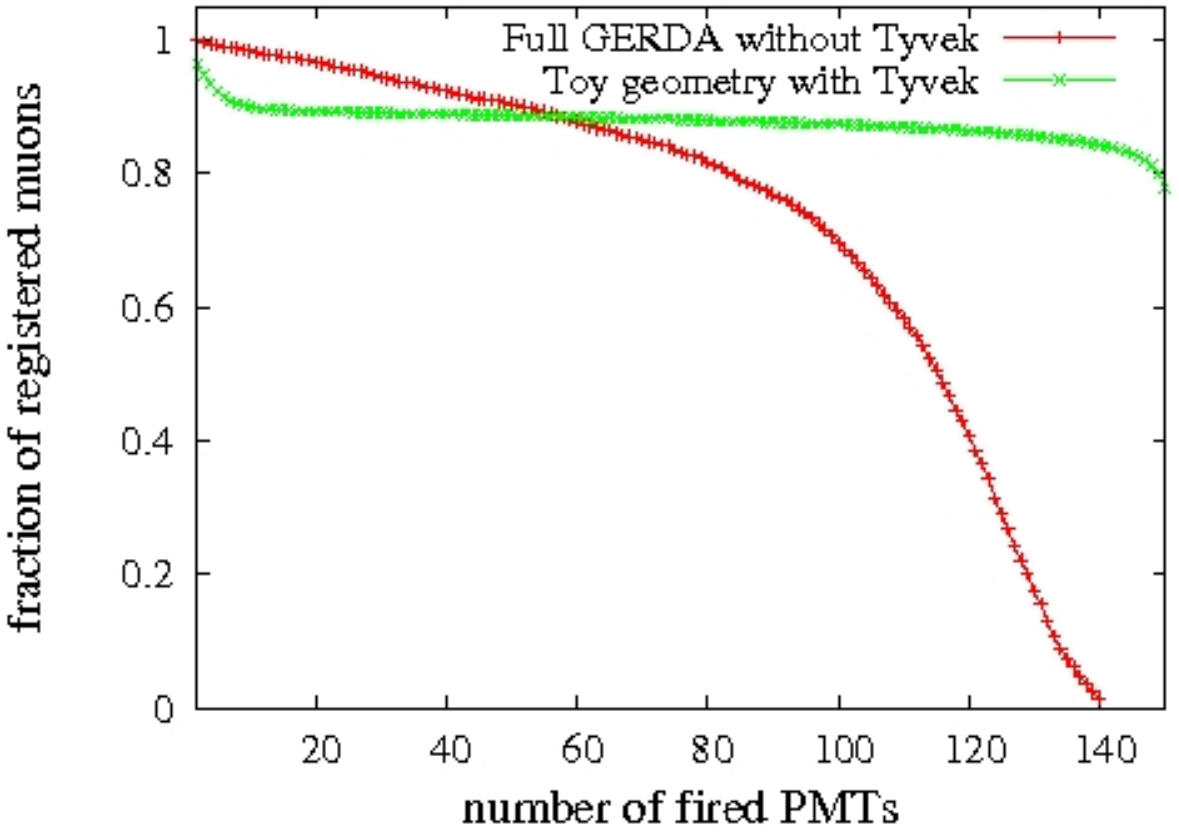
Cherenkov veto for the full GERDA-geometry

With the minimum number of fired PMTs as threshold, even at high thresholds, most muons are registered.



Comparison to Toy-geometry

With Tyvek, the threshold can be increased dramatically .



Cherenkov veto for the full GERDA-geometry

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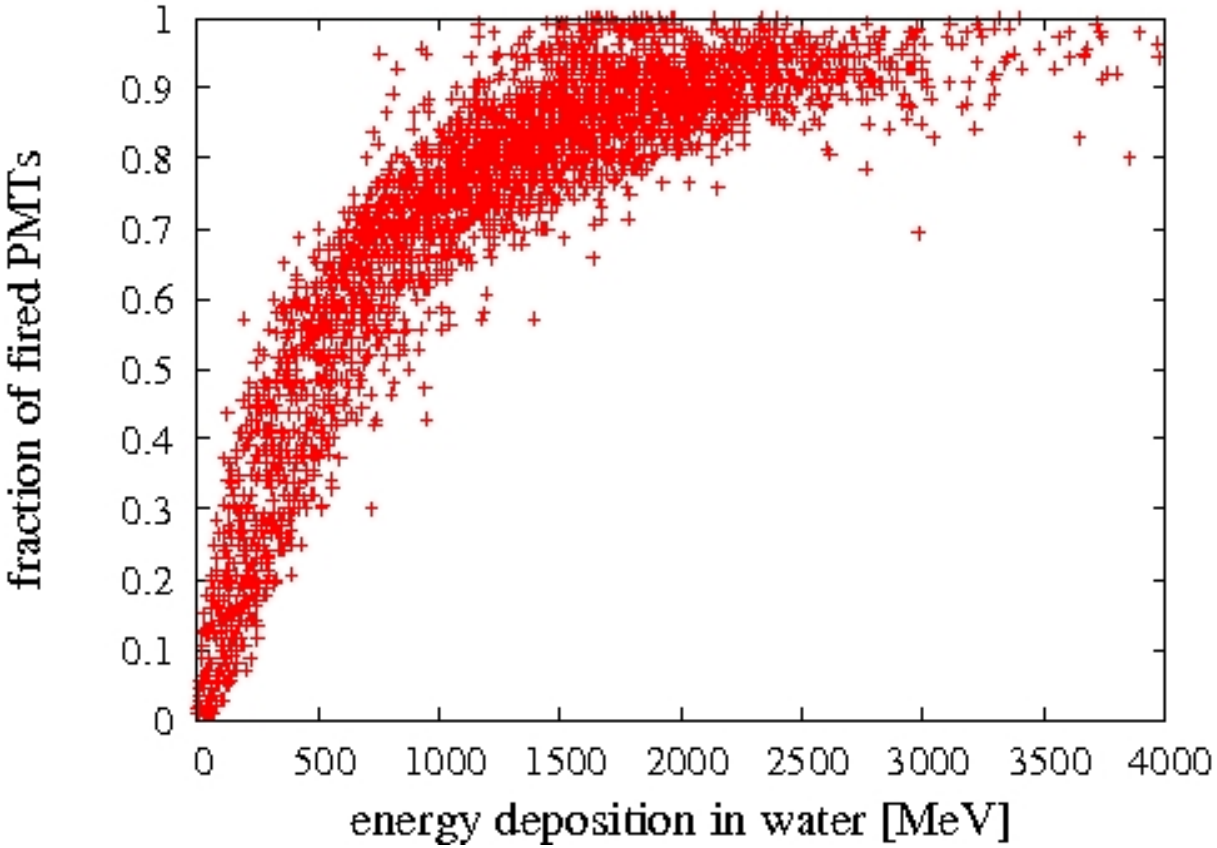
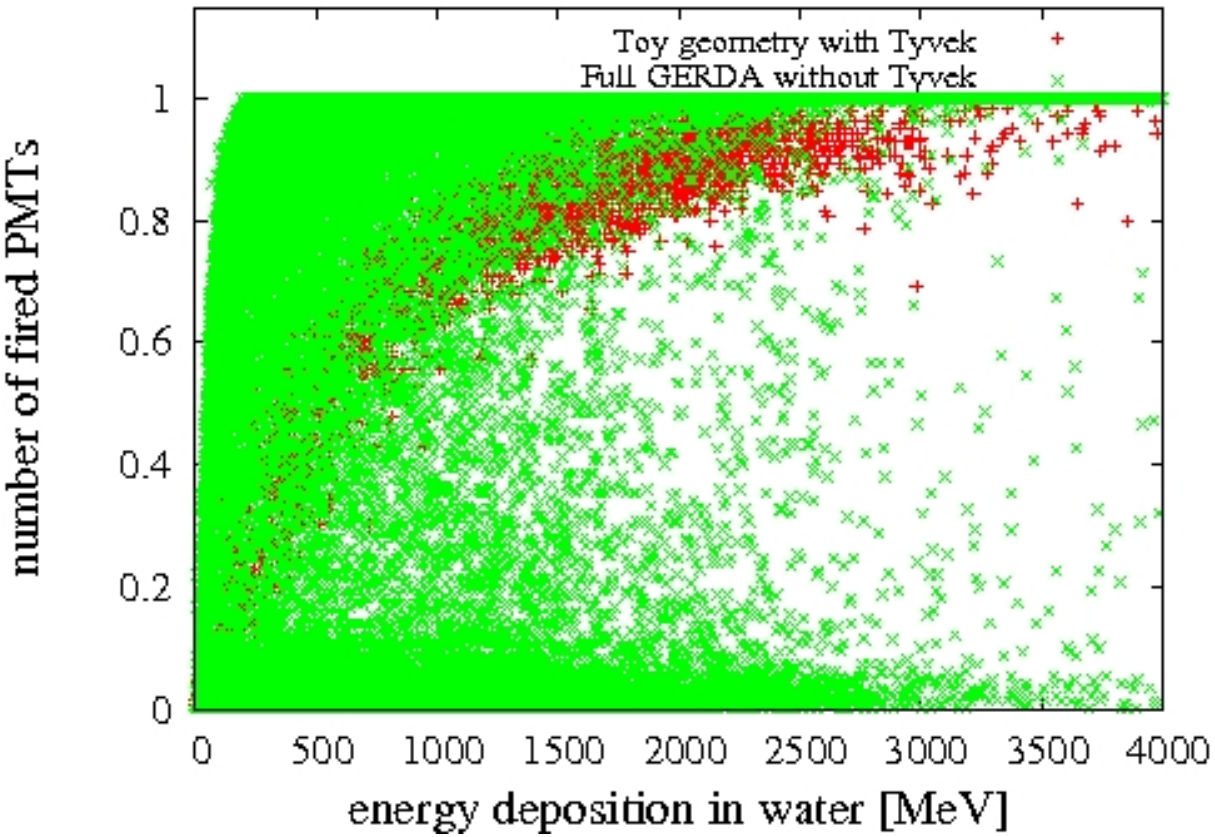


Comparison to Toy-geometry

With Tyvek, the curve rises much faster.



Outlook

- Simulation of the Cherenkov veto for the full GERDA- geometry
  - include Tyvek,
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  - low energy (dark matter)
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- Improvement of the algorithm for runtime.
- Inclusion of the final version into the MaGe-framework.

Conclusion

- Much has to be done, before there will be a simulation of the Cherenkov veto for the full GERDA-geometry.
- First results show:
  - Efficient veto seems to be no problem.
  - Even reduction of necessary PMTs seems to be possible.