

AGATA Capsules Modeling : replacing ADL in the on-line

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Why replace the ADL basis

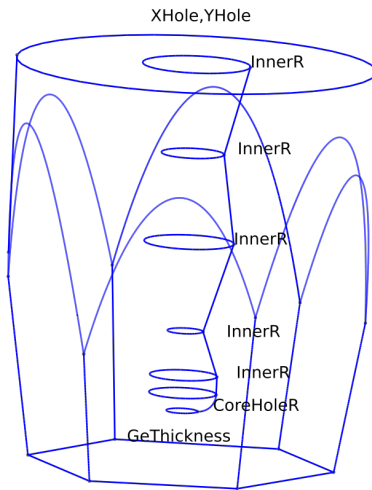
What is missing with ADL...

- No active development of the code nor model (of my knowledge).
- No easy recipe to create a basis for a new crystal.

...that AGATAGeFEM offers

- Active development of the code and model.
- Easy recipe to create a basis for a new crystal.
- More possibilities to vary crystal geometry, such as varying bore hole radius as a function of depth (and more).

Why replace the ADL basis



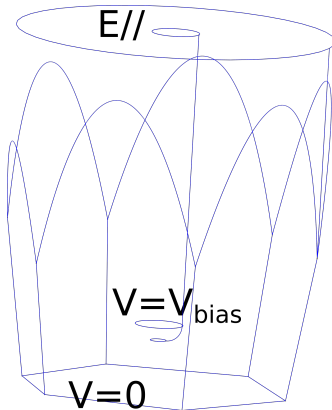
What to, and not to, expect from this

- The performance of PSA and Neutron Correction stay the same.
- Quick update of bases if needed.
- We don't expect a mayor improvement of the performance of PSA.

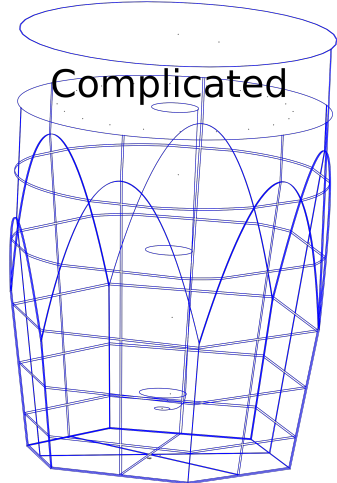
A look into the details of differences

Boundary conditions for the electric field

ADL



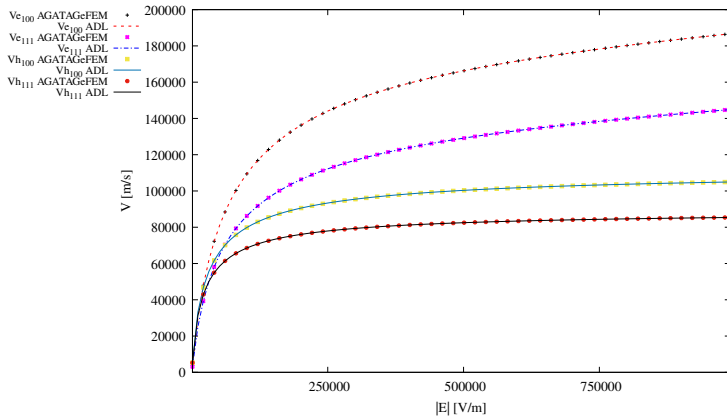
AGATAGeFEM



A look into the details of differences

Charge carrier velocities models

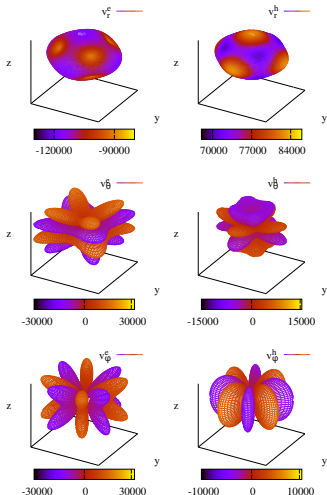
Parameters of ADL model fitted to AGATAGeFEM



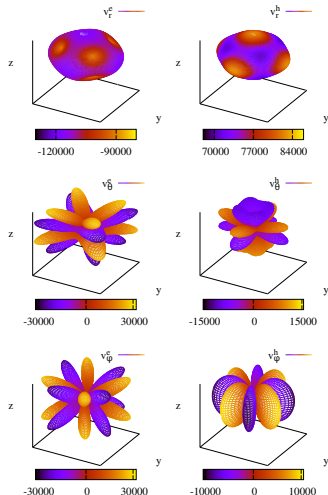
A look into the details of differences

Charge carrier velocities models

ADL



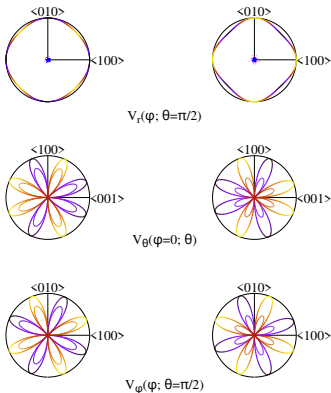
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A look into the details of differences

Charge carrier velocities models

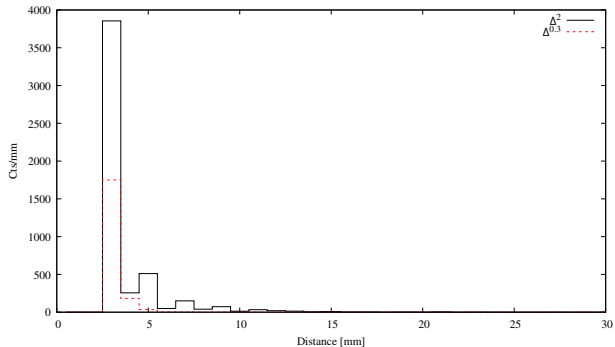
Thick lines AGATAGeFEM, thin lines ADL



Impact of different charge carrier transport models

ADL/AGATAGeFEM model in AGATAGeFEM fields/transport code

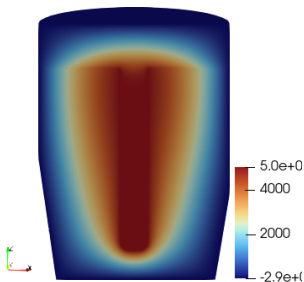
One base ~ 45 kPts



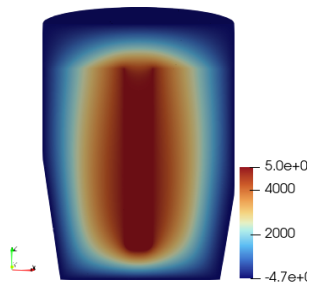
Details of the AGATAGeFEM bases

Electric potential A001 and A006

A001



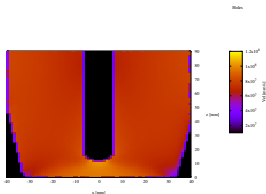
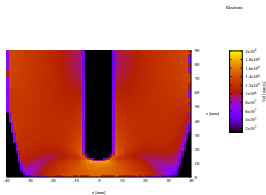
A006



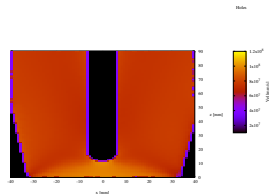
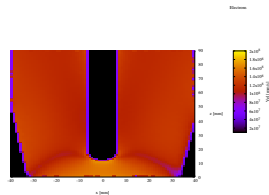
Details of the AGATAGeFEM bases

Magnitude of charge carrier vel

A001



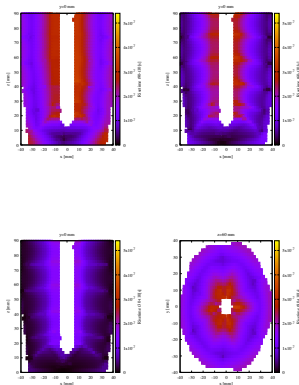
A006



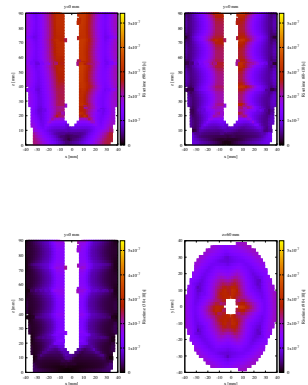
Details of the AGATAGeFEM bases

Risetimes

A001



A006



Available AGATAGeFEM bases

A001-A025 (no A021)

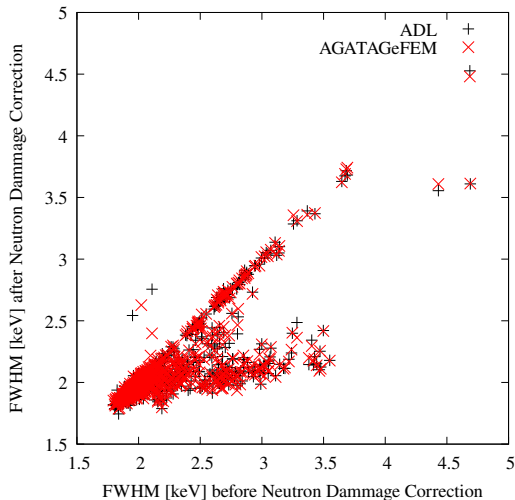
B001-B025 (no B024)

C001-C023 (no C022)

This for Core radii of 5.5 mm, 6.0 mm, 6.5 mm, and 7.0 mm.

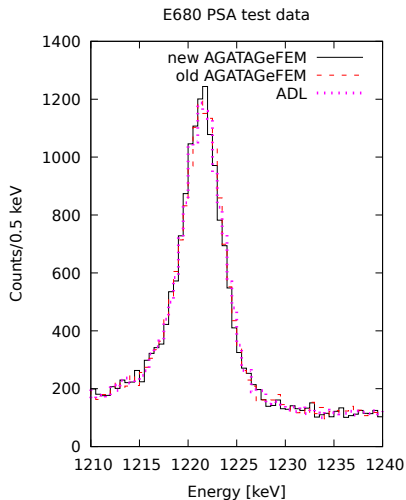
Validation of bases (6 mm Core radius)

Neutron-damage correction



Validation of bases (6 mm Core radius)

PSA using benchmark data set



Access to the code and testing it

A public (for reading) git repository

<https://gitlab.in2p3.fr/joa-ljungvall/agatagefem>
Reasonable well documented using README.md

A docker available (thank you Jérémie)

https://gitlab.in2p3.fr/ip2igamma/docker_images
branch agatagefem

Fields for existing detectors are (will be) available on irods where the bases are found, see talk of J. Dudouet. Calculating the fields is possible with the docker image but long and not really useful if one only wants to calculate pulses for some application (simulations, PSA dev. e.g.)