

Shielding Verification with Dose Rate Maps and Isosurface Visualization

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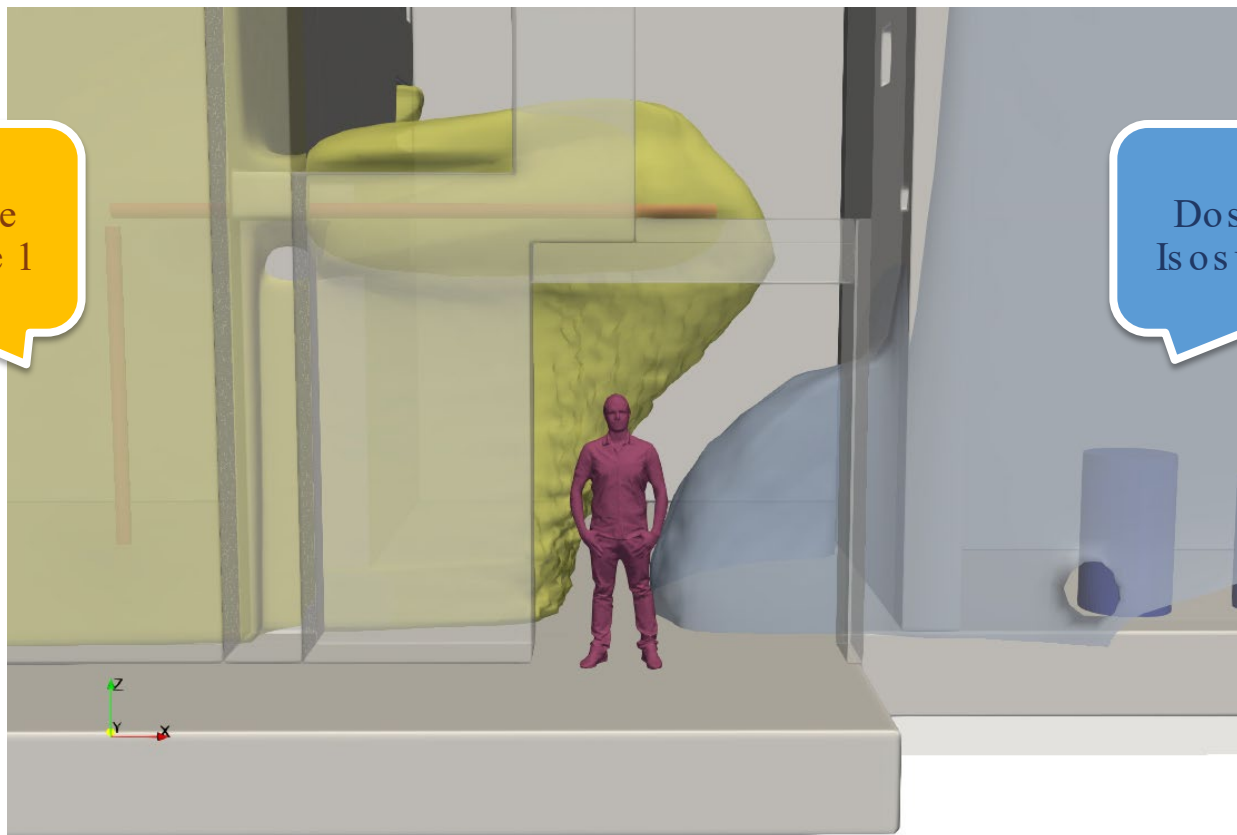
Nuclear Projects Division
Radiation Transport Department



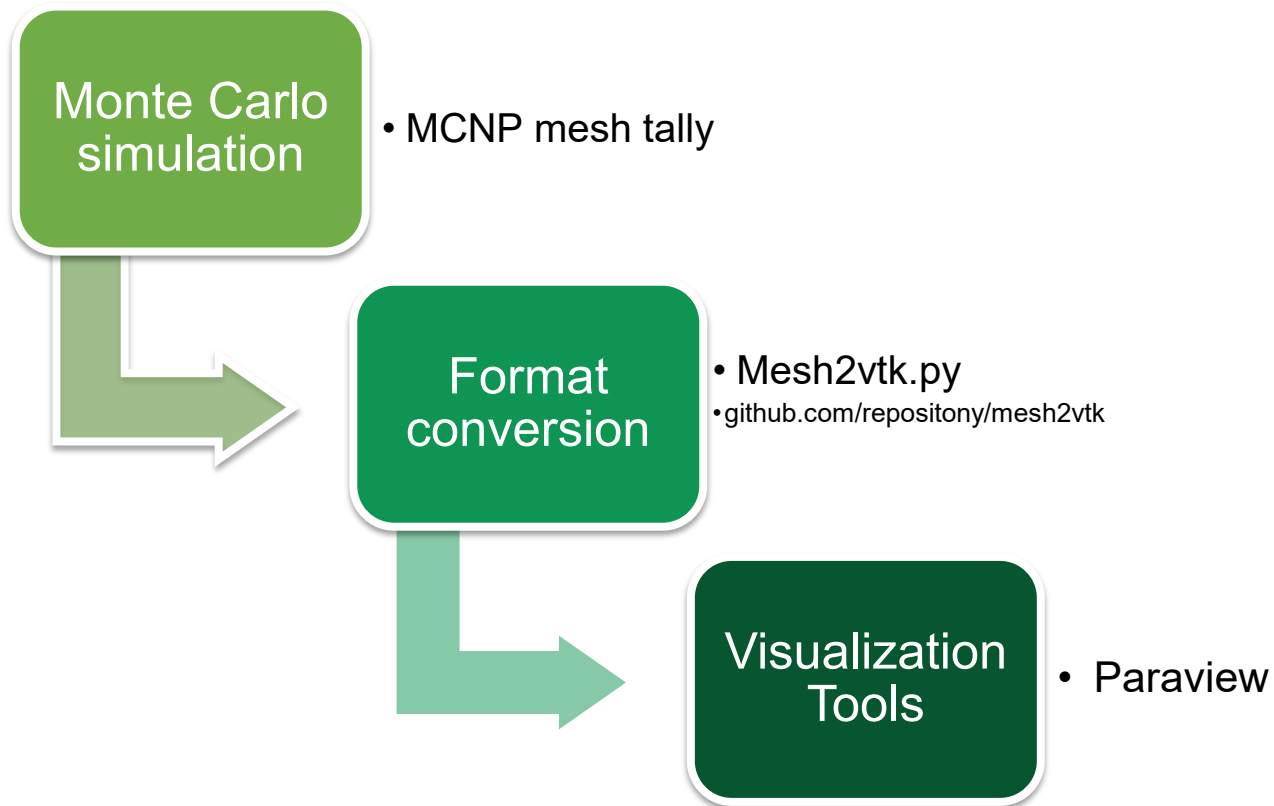
Outline

1. Introduction & Motivation
2. Methodology
3. Visualization and Analysis
4. Application cases
5. Conclusion

Motivation



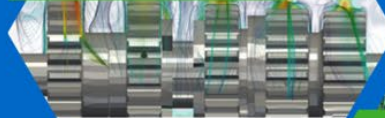
Methodology



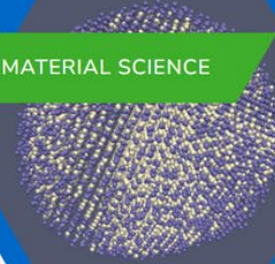
Para view w

SOLUTIONS
**See all the ways you
can use ParaView**

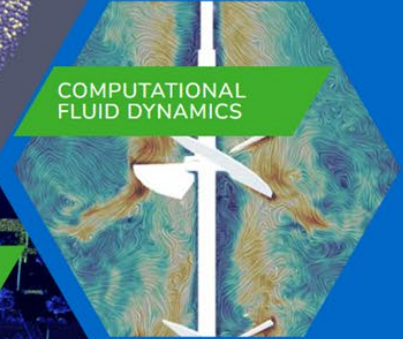
ENGINEERING



MATERIAL SCIENCE



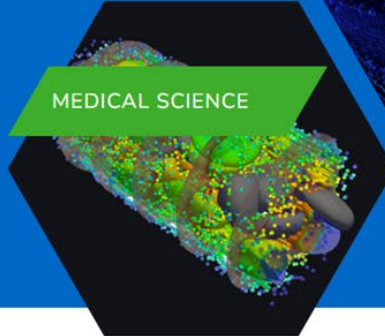
COMPUTATIONAL
FLUID DYNAMICS



SENSOR DATA



MEDICAL SCIENCE



Para view most relevant tools

01

Cell Data to Point Data

Converts simulation values from mesh cells to points for smoother and more accurate visualizations. It allows next steps such as **Contour**.

02

Slice

Extracts a 2D cross-section from the 3D dose rate field to clearly visualize distribution on a selected plane.

03

Find Data

Queries and highlights specific values (e.g., dose rate, relative error) to locate critical or non-converged regions.

04

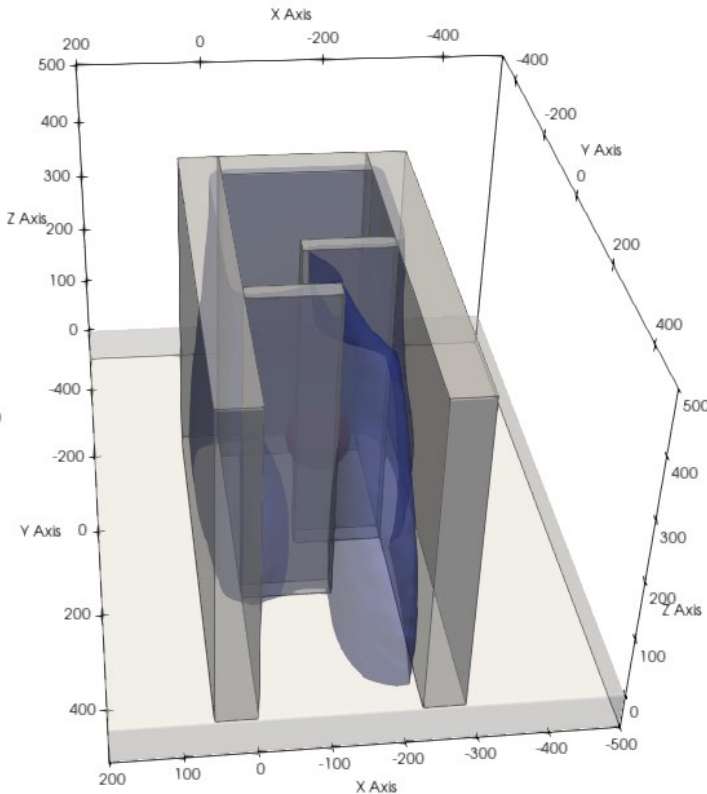
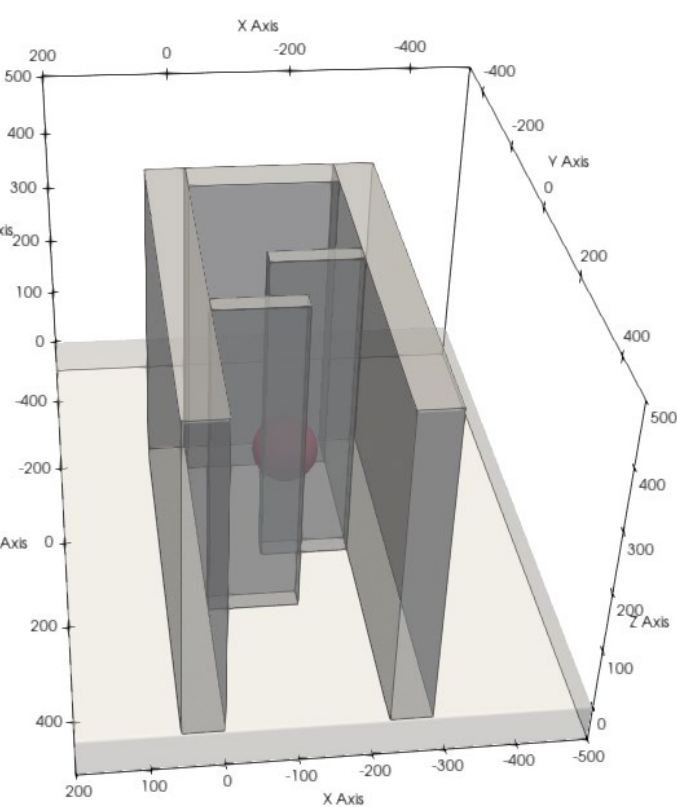
Contour

Creates isosurfaces at chosen dose rate thresholds to visualize spatial limits for shielding verification.

 **Labyrinth geometry** Discontinuities in Shielding Multiple Sources Facility Layout

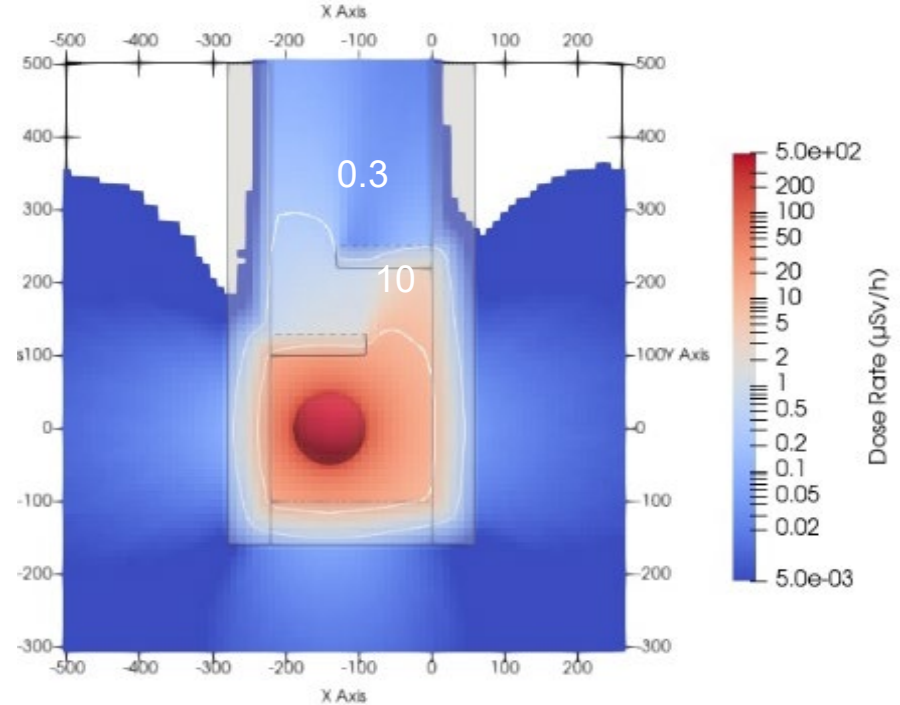
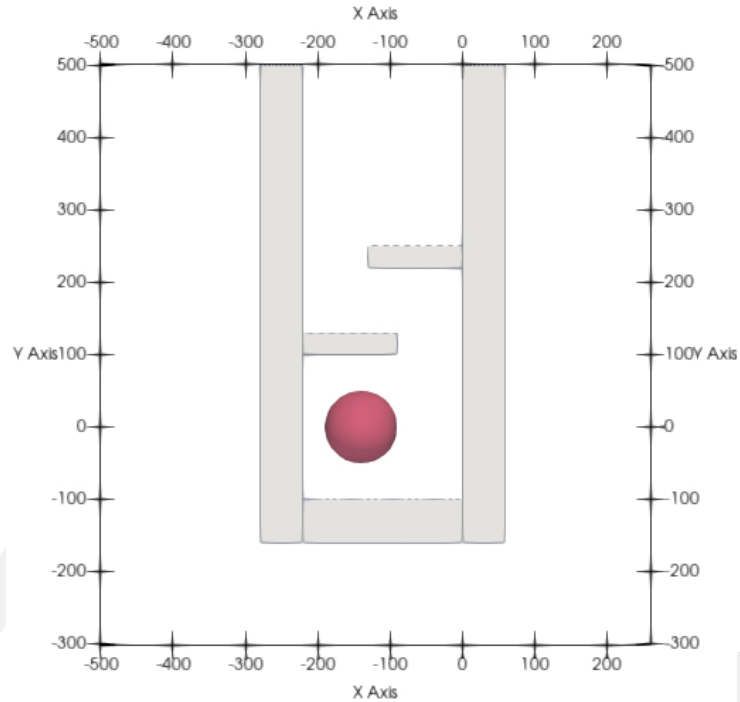
Application cases

Labyrinth geometry



Application
cases

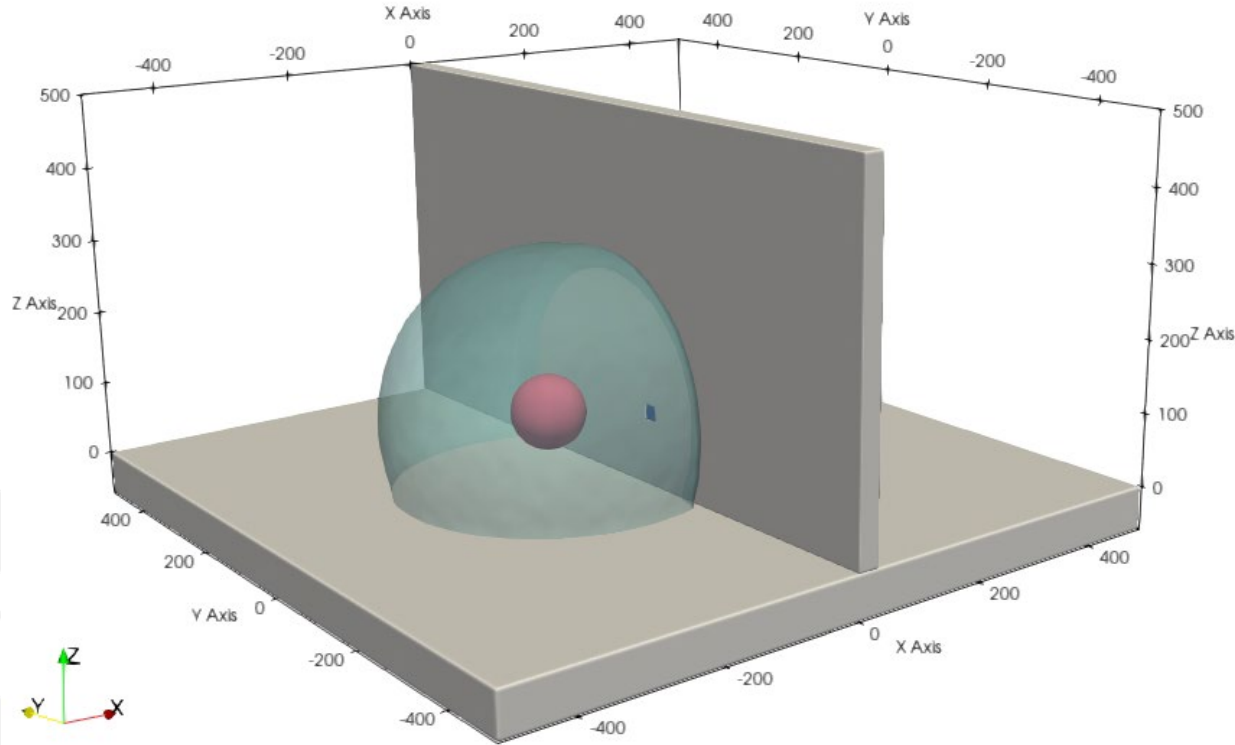
☪ Labyrinth geometry



 Labyrinth geometry **Discontinuities in Shielding** Multiple Sources Facility Layout

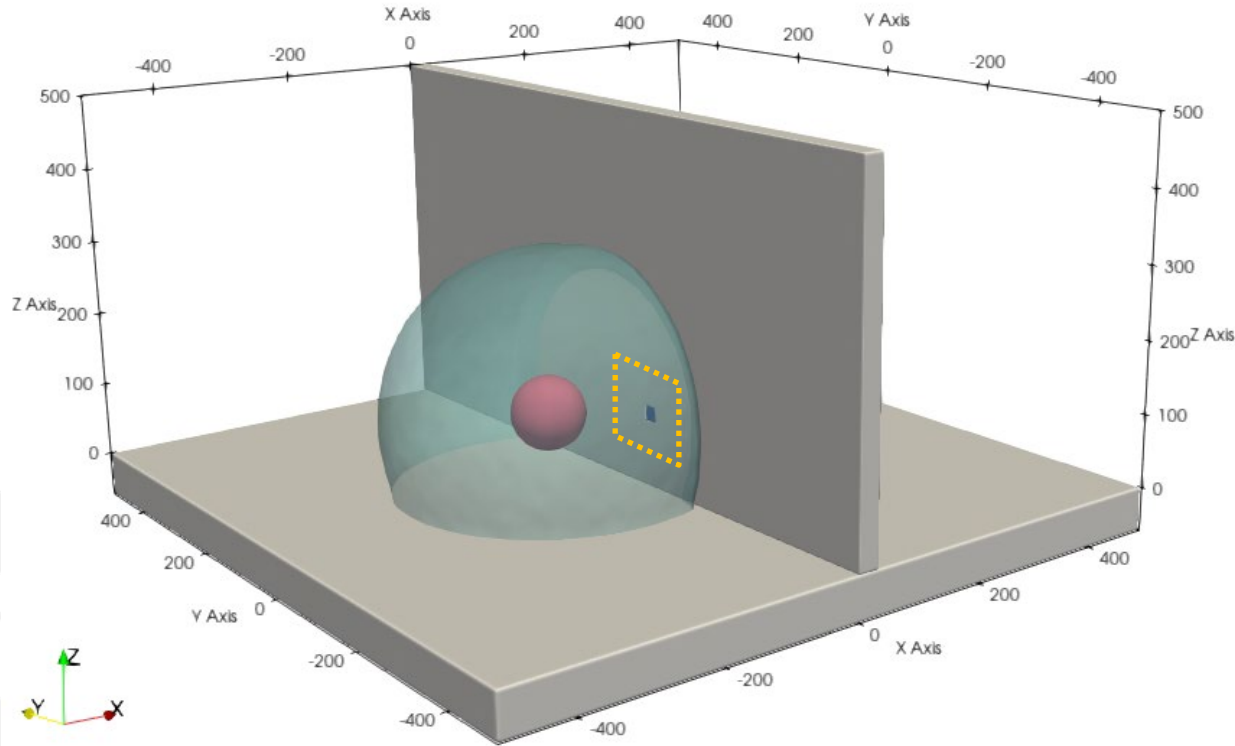
Application cases

Discontinuities in Shielding



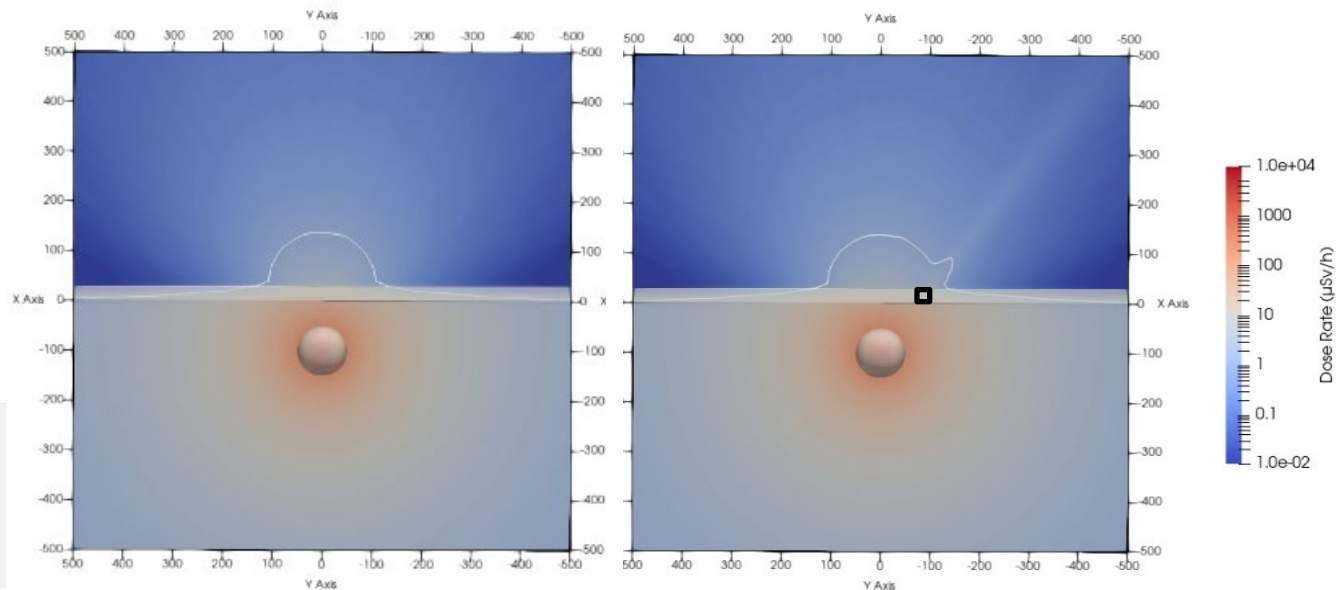
Application
cases

Discontinuities in Shielding



Application
cases

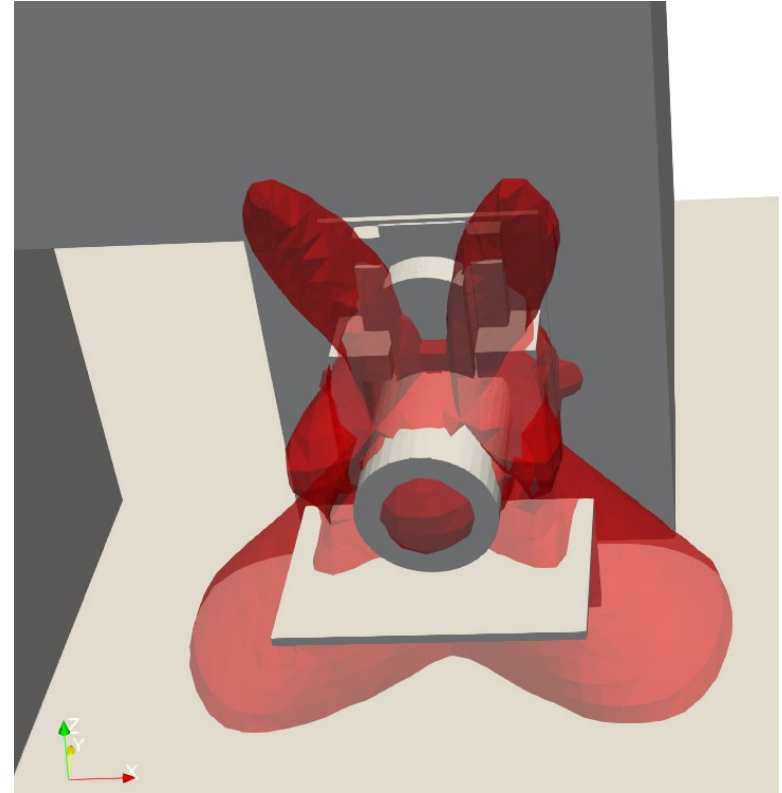
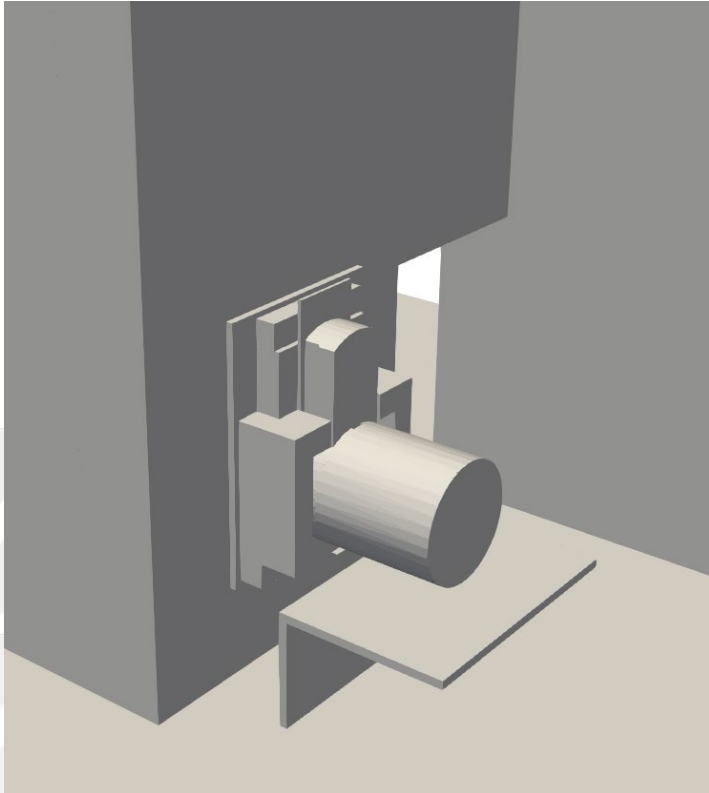
Discontinuities in Shielding



Application
cases

Discontinuities in Shielding

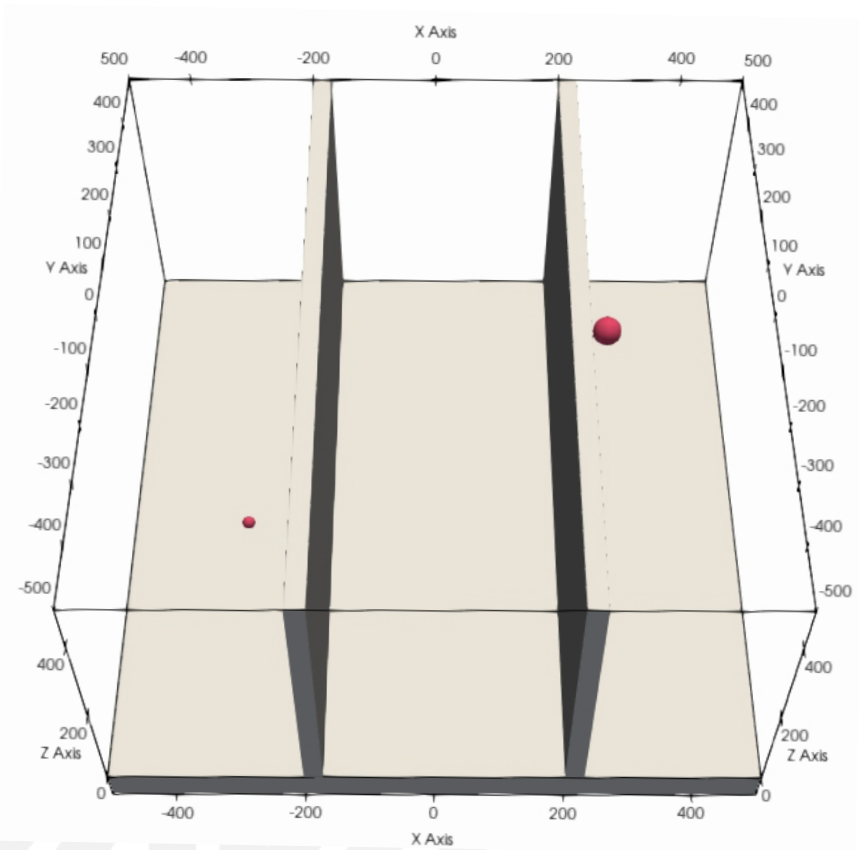
Streams in Dose Rate Isosurfaces



- ✱ Labyrinth geometry
- ✱ Discontinuities in Shielding
- ✱ **Multiple Sources**
- ✱ Facility Layout

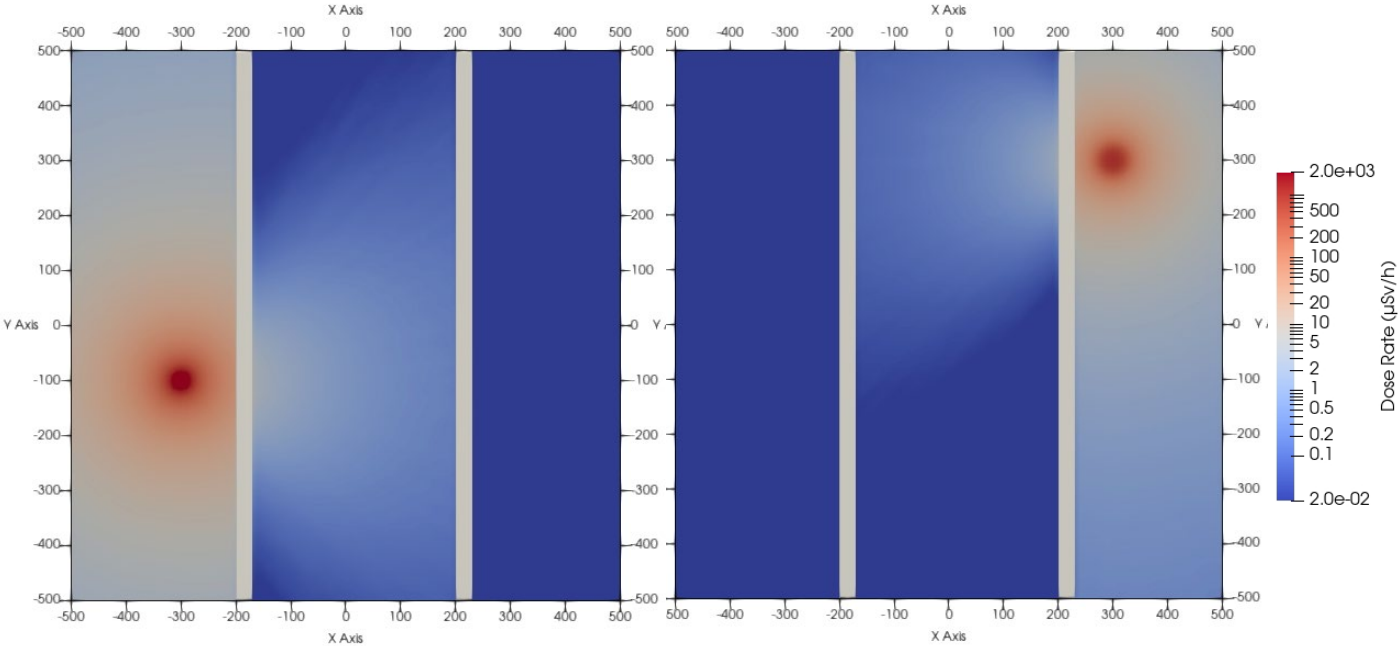
Application cases

Multiple Sources



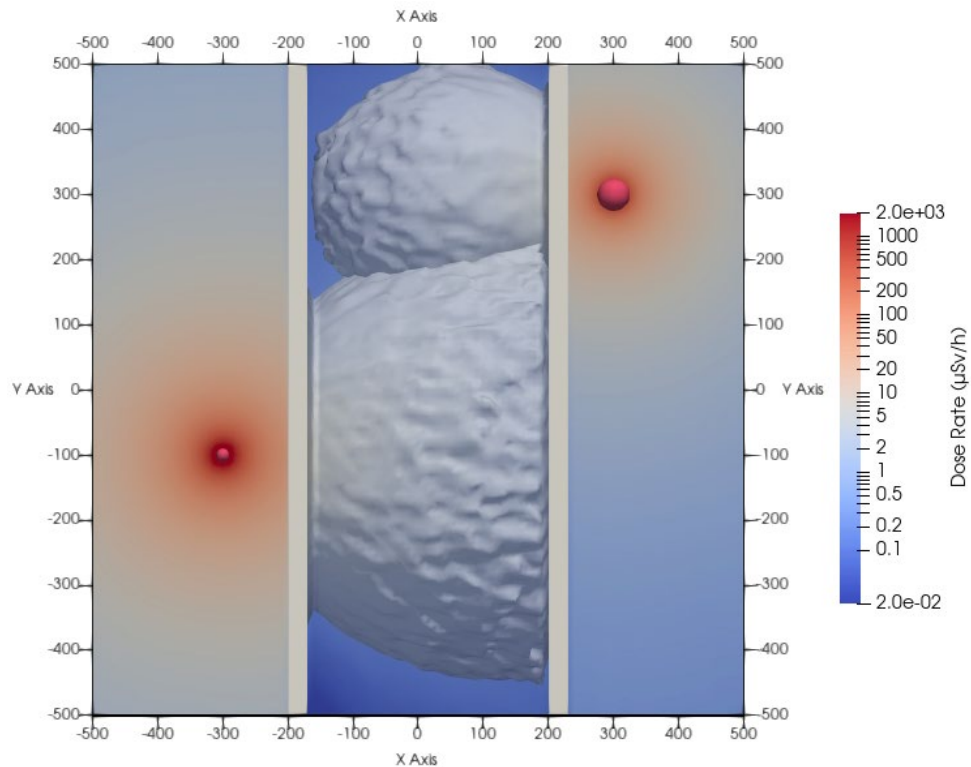
Application
cases

Multiple Sources



Application
cases

Multiple Sources

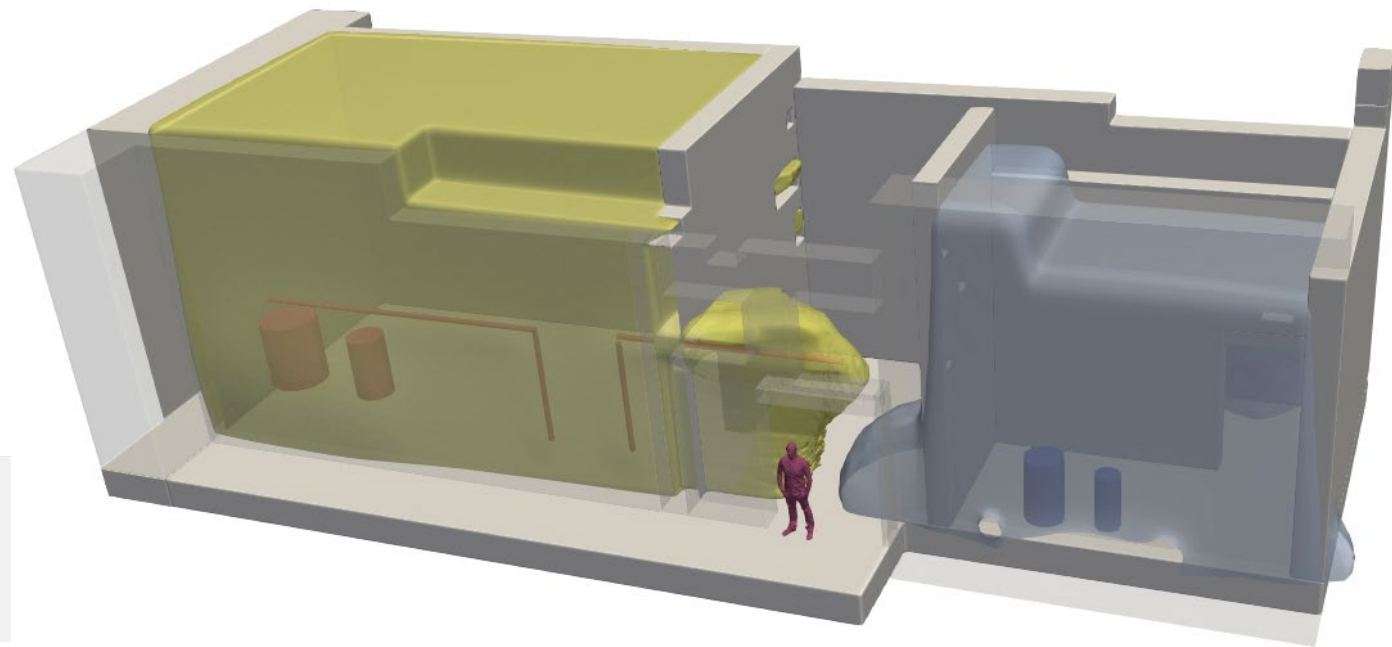


Application
cases

- ✱ Labyrinth geometry
- ✱ Discontinuities in Shielding
- ✱ Multiple Sources
- ✱ **Facility Layout**

Application cases

Facility Layout



Application
cases

Facility Layout

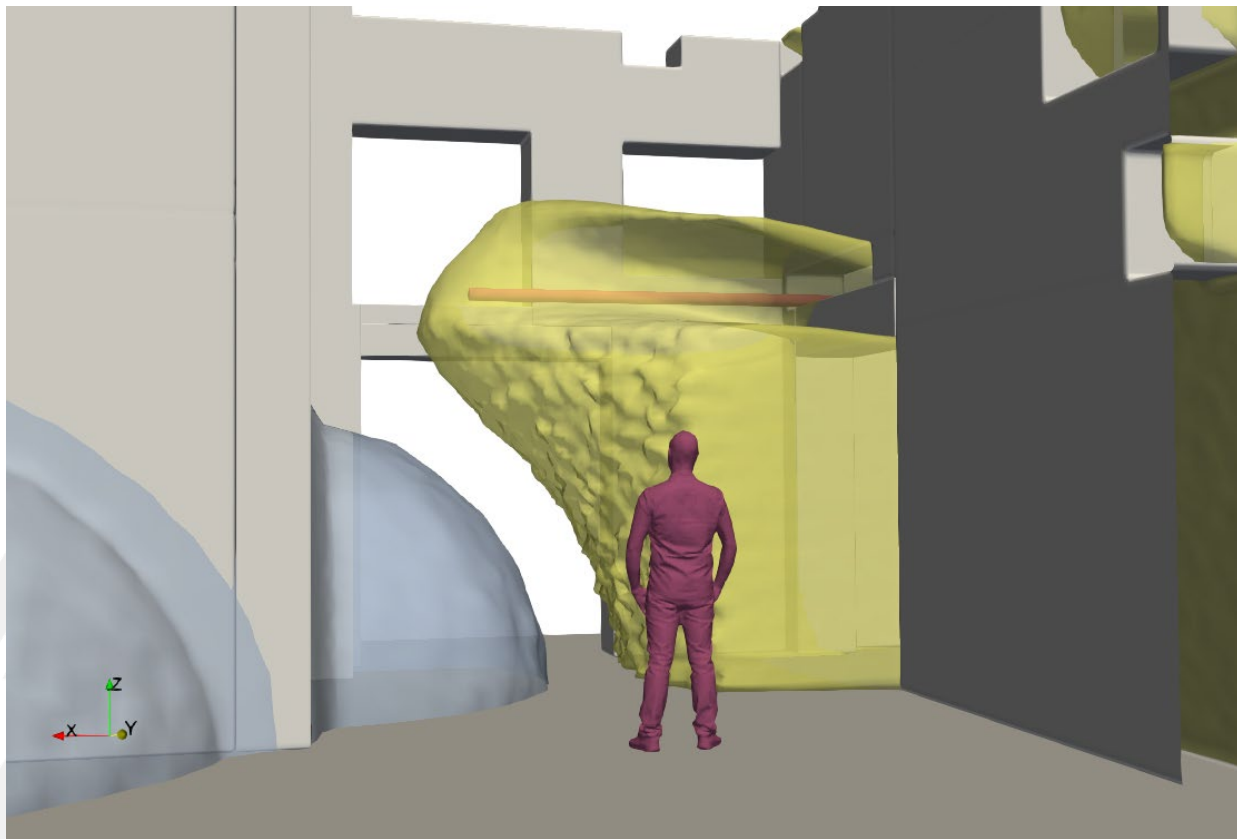
Dose Rate
Isosurface 1

Dose Rate
Isosurface 2



Application
cases

Facility Layout



Application
cases

Advantages

1. Improved spatial understanding
2. Clear identification of critical areas
3. Support for quantitative evaluation, including local maxima and statistical uncertainties
4. Enhanced assessment of multiple sources
5. Improves multidisciplinary interactions and understanding of the scenario

Conclusions

- A practical and insightful way to support shielding verification and design decisions, especially in complex geometries
- It doesn't replace quantitative analysis, but it directs attention where needed

ご清聴ありがとうございました
Thank you for your kind attention

ご質問があればどうぞ
Feel free to ask any questions

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