

PAUL SCHERRER INSTITUT



Space IT

Paul Scherrer Institut



# G4RMC status

Laurent Desorgher

like spectrum (Juice mission)  
**Outline**

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- Implementation of gamma splitting to improve convergence for some simulation case
- Migration of Reverse MC to MT

# Convergence test

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## Test description

- Primary Jupiter electron spectrum
- Dose behind thick shielding of Aluminum or Tantalum
- Test with or without some reverse processes
- Look at convergence of the results

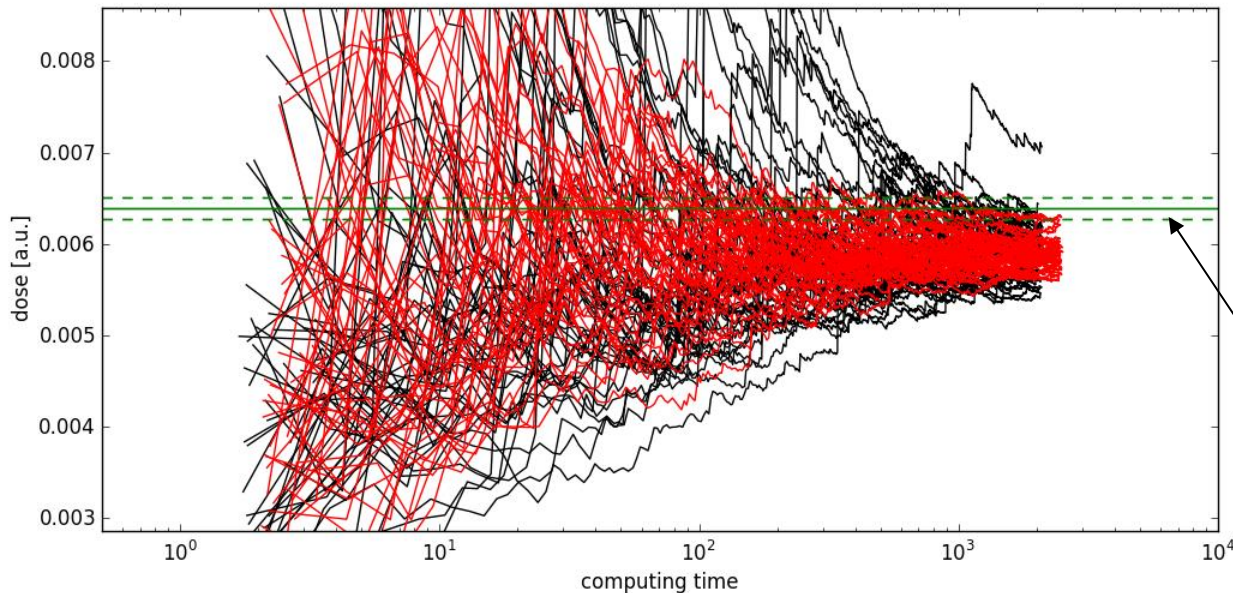
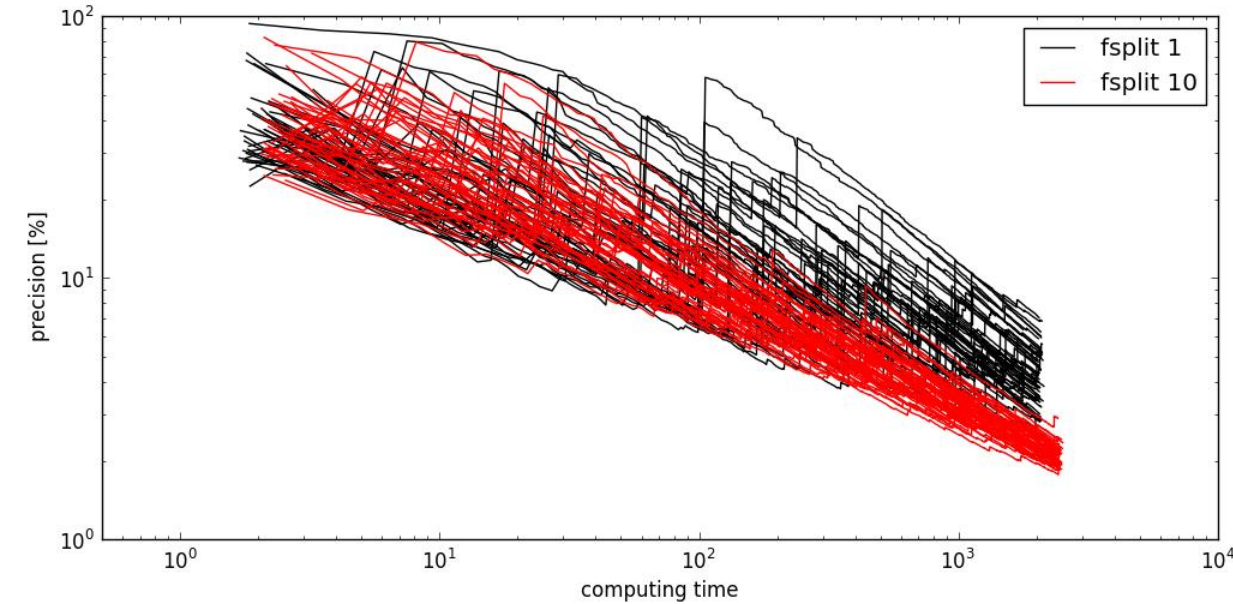
## Problem of convergence in some cases

- Dose peak can slow down drastically the convergence of the results

## Convergence can be improved by

- Switching off the reverse Compton and photo electric reactions
  - Splitting of forward gamma on the adjoint source
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# Example Convergence Ta 2mm housing



- 50 simulations
- No gamma splitting  
fsplit=1
- **Gamma splitting**  
fsplit =10
- Splitting of gamma  
remove a lot of dose  
peak and increase  
therefore the  
convergence
- 10-15% Lower dose  
compared to forward

Fwd dose

# Ongoing Migration to MT mode

- Migration to MT implies important changes in the Reverse MC
- Forward and backward trackings are now handled in the same event in order to be treated by the same worker
- New class G4MTAdjointRunManager to control the adjoint simulation from the master side
- New class G4AdjointUserActionInitialization
  - Replace the UserActionInitialization
  - In Build and BuildForMaster call the Build and BuildForMaster methods of UserActionInitialization
- Status of development:
  - Main code developed
  - ReverseMC compiled in non MT mode is working as before
  - Test of the ReverseMC in MT mode block at some barrier->still need to figure out why