Uncertainty assessment of DIPCOT based on the NERIS ADM experiment

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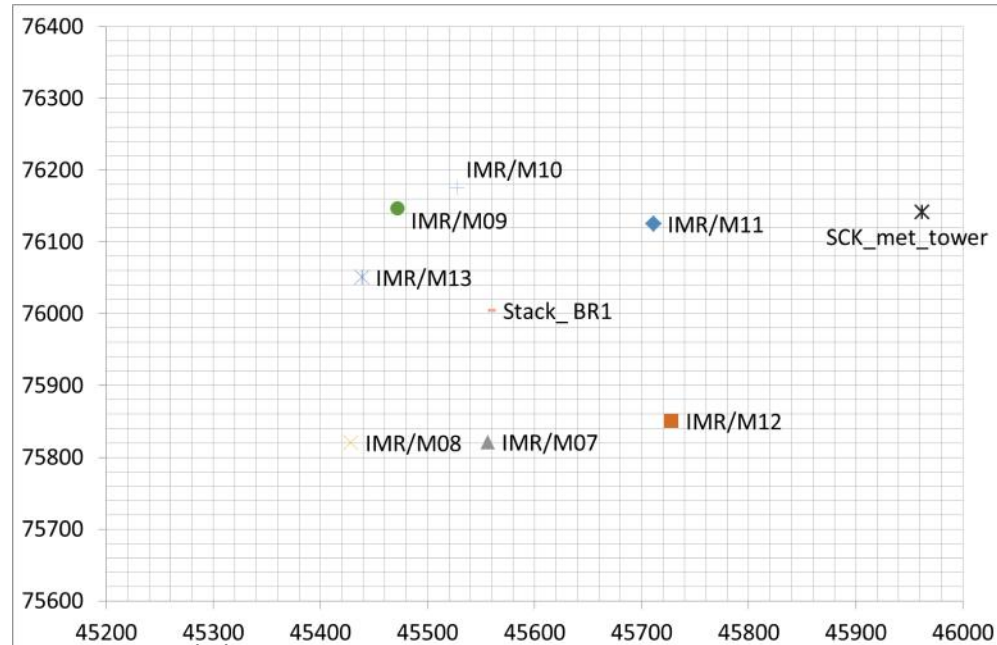
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Test Case

- The NERIS near-range atmospheric dispersion modelling experiment
  - Coordination and data provision by SCK•CEN
  - Routine Ar-41 stack releases of BR1 at SCK•CEN and gamma radiation dose rate measurements from 7 stations at ~ 200 m around the stack
  - 4-hour intervals in 16 different days

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Goal of the Study

- Simulations by ADM DIPCOT and assessment of uncertainties due to:
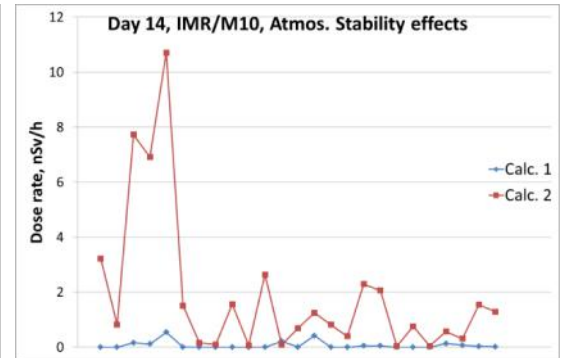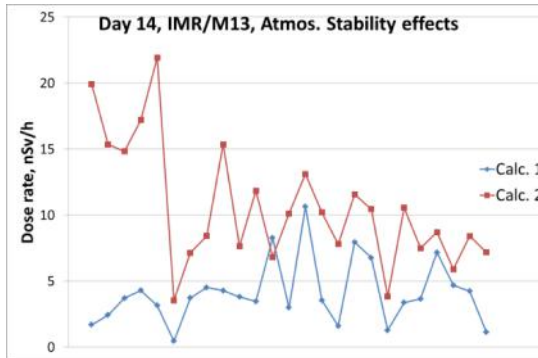 - Input data
  - Modelling options
  - Atmospheric turbulence

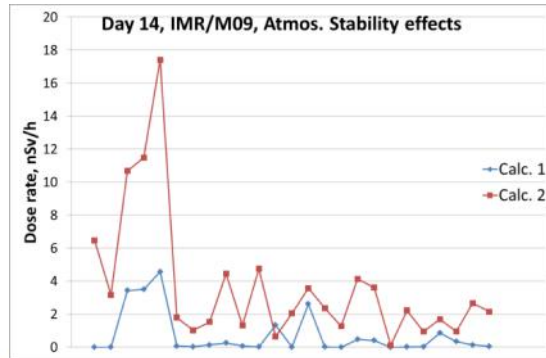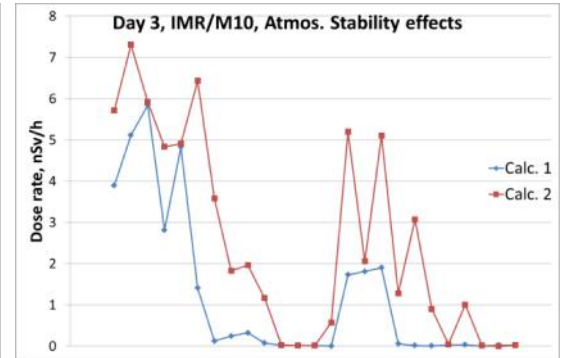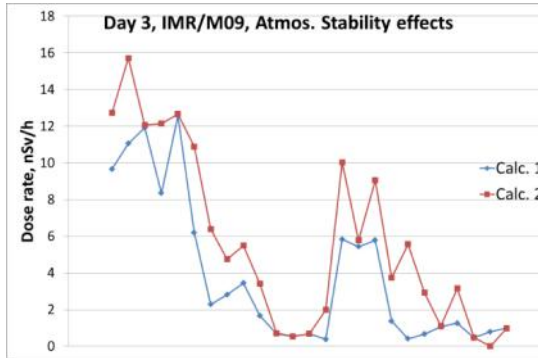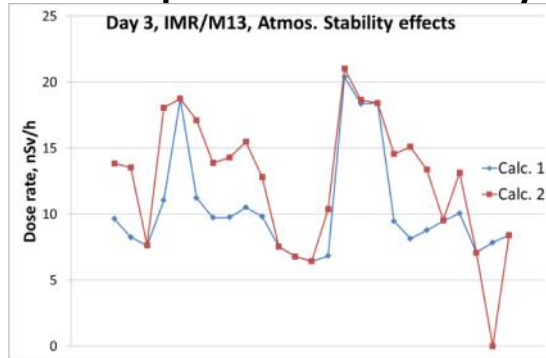NATIONAL CENTRE FOR SCIENTIFIC RESEARCH "DEMOKRITOS"

Given Input data and uncertainties

- Source term: activity release rate, stack height and diameter, exit velocity and temperature

- Meteorology: wind speed and direction at 69m, temperature at 8 and 114m, horizontal and vertical standard deviation of wind direction

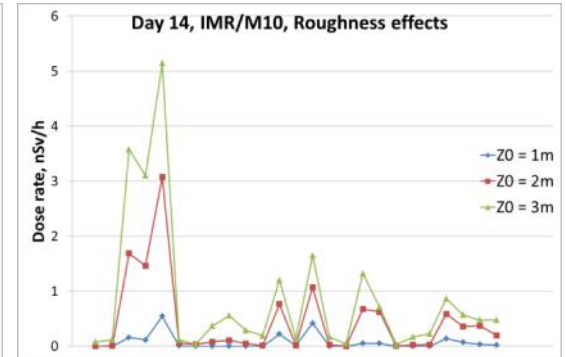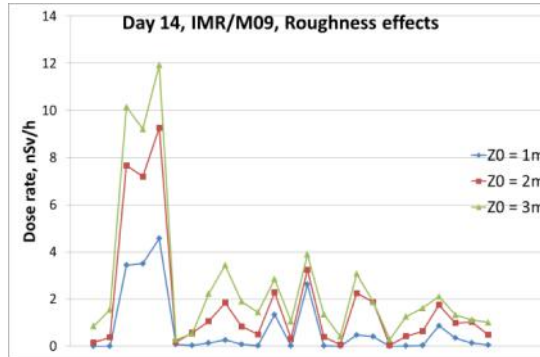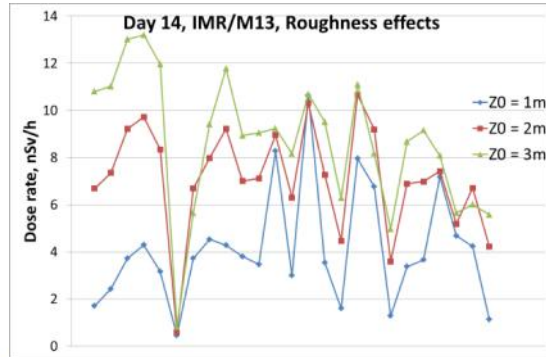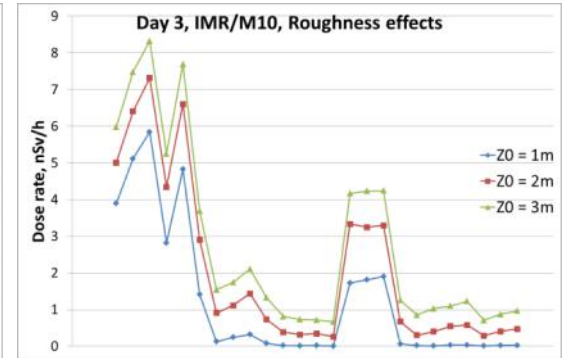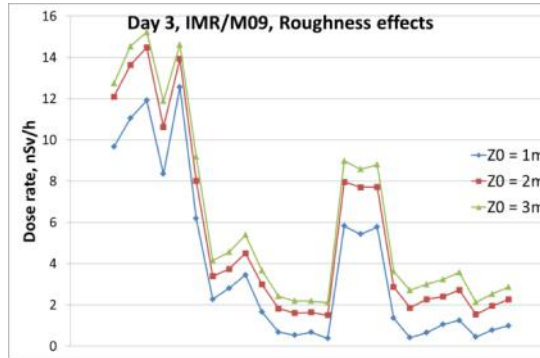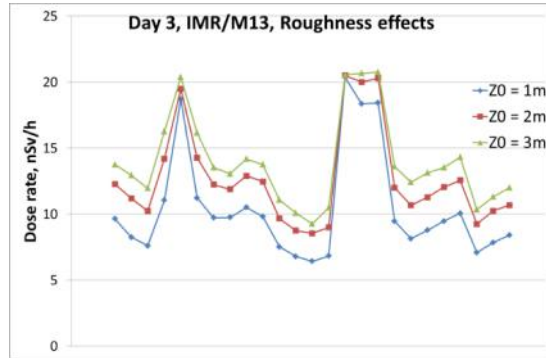- Uncertainties in meteorological data: atmospheric stability, surface roughness

Uncertainties due to input data

- Atmospheric stability

Uncertainties due to input data
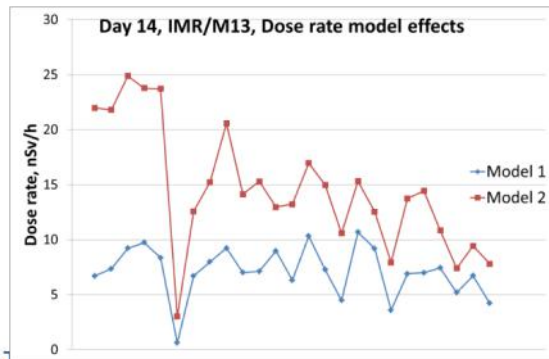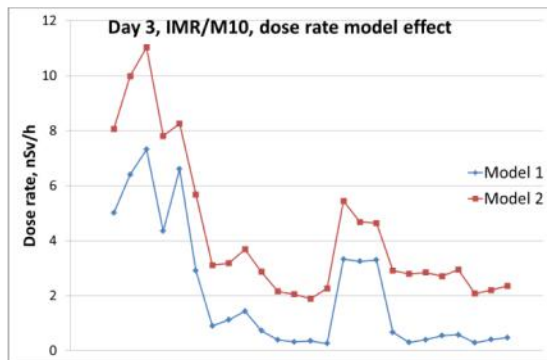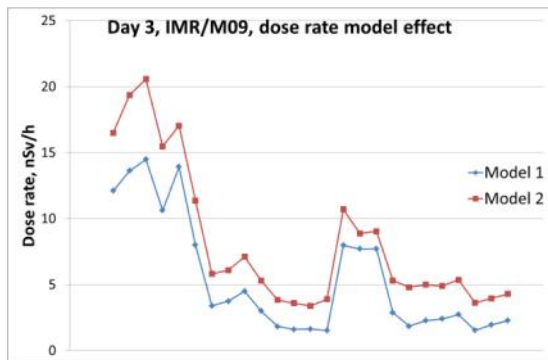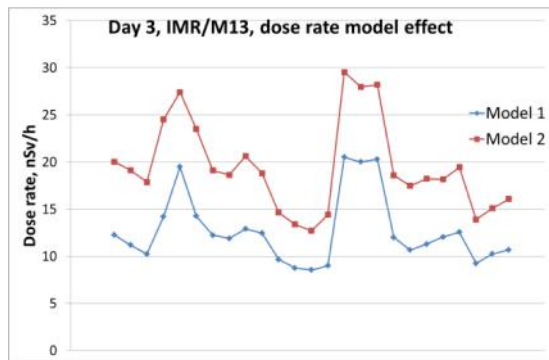
- Surface roughness

Uncertainties due to modelling options
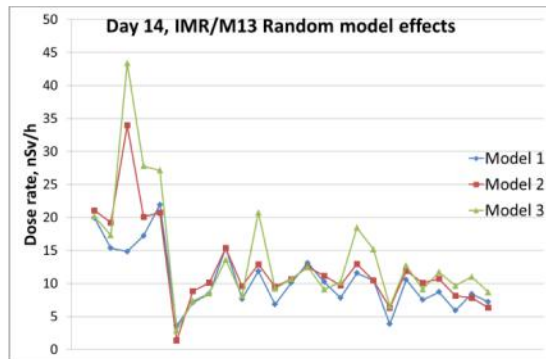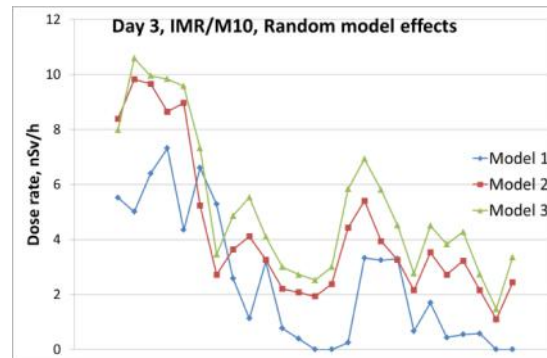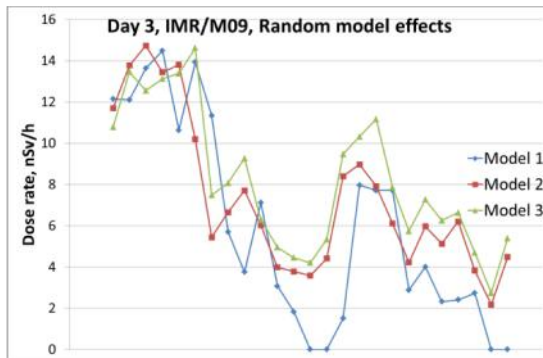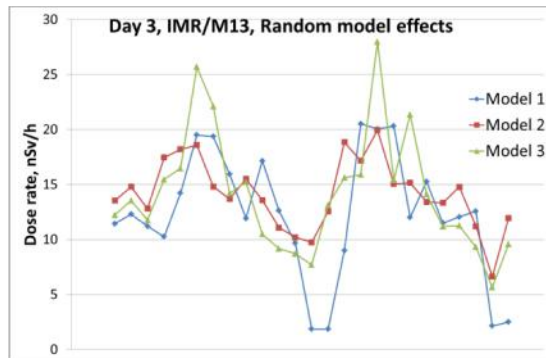
- Lagrangian puff – Lagrangian particle ⇒ different gamma radiation calculation method

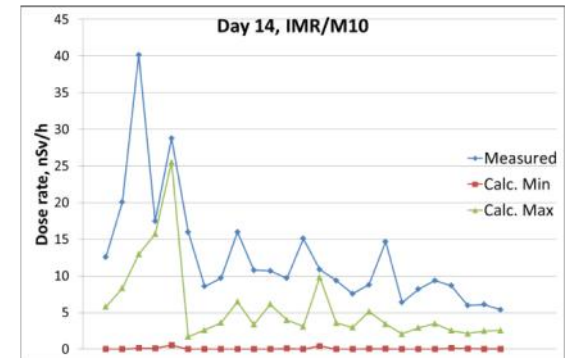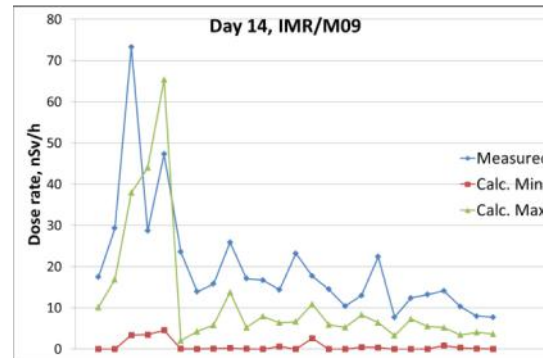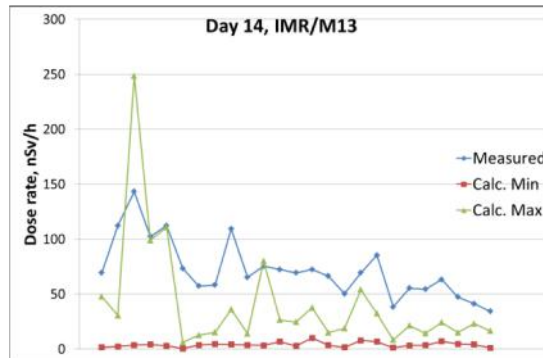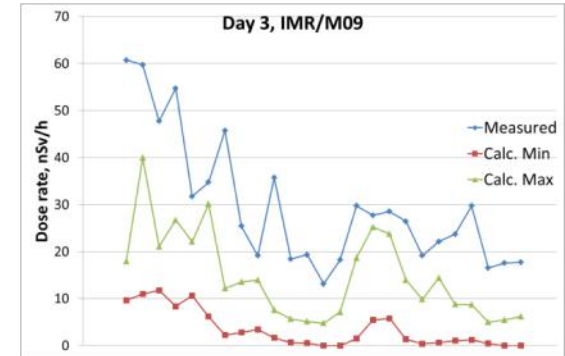# Uncertainties due to modelling options

- Turbulent diffusion: random velocities – random walk

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Combined Results

Conclusions

- Considerable spread in model results, but underestimation of measured data in most cases
- Few overestimations
- Evolution in time well captured in most cases
- Some unknown parameter seems not to have been considered (building effects?) – further investigation
- Stochastic effects have not been considered yet

Thank you very much for your attention

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