



Queen Mary

University of London

Science and Engineering

Optical Simulations for LhARA test stand (8)

Peter Hobson

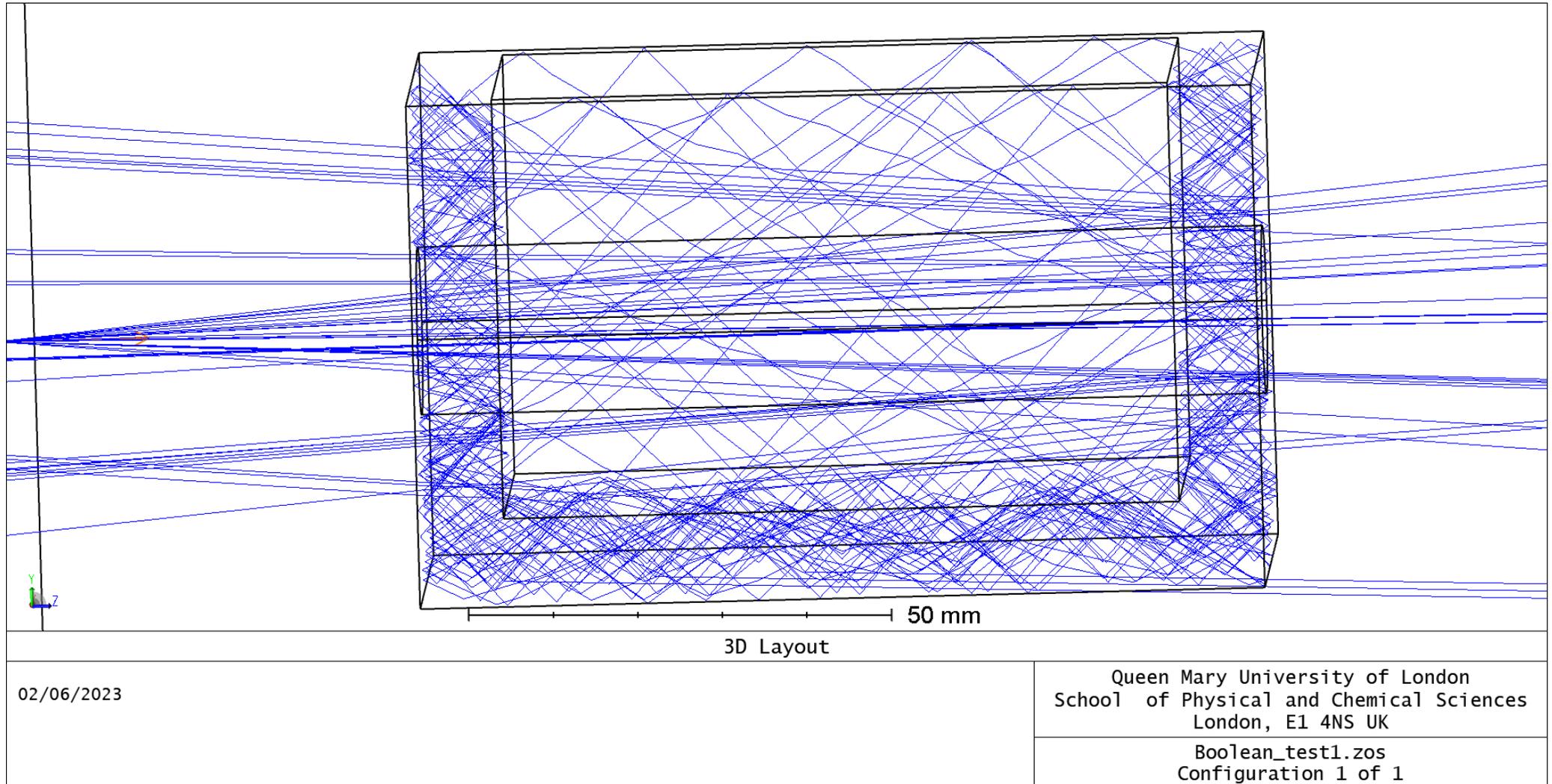
School of Physical and Chemical Sciences

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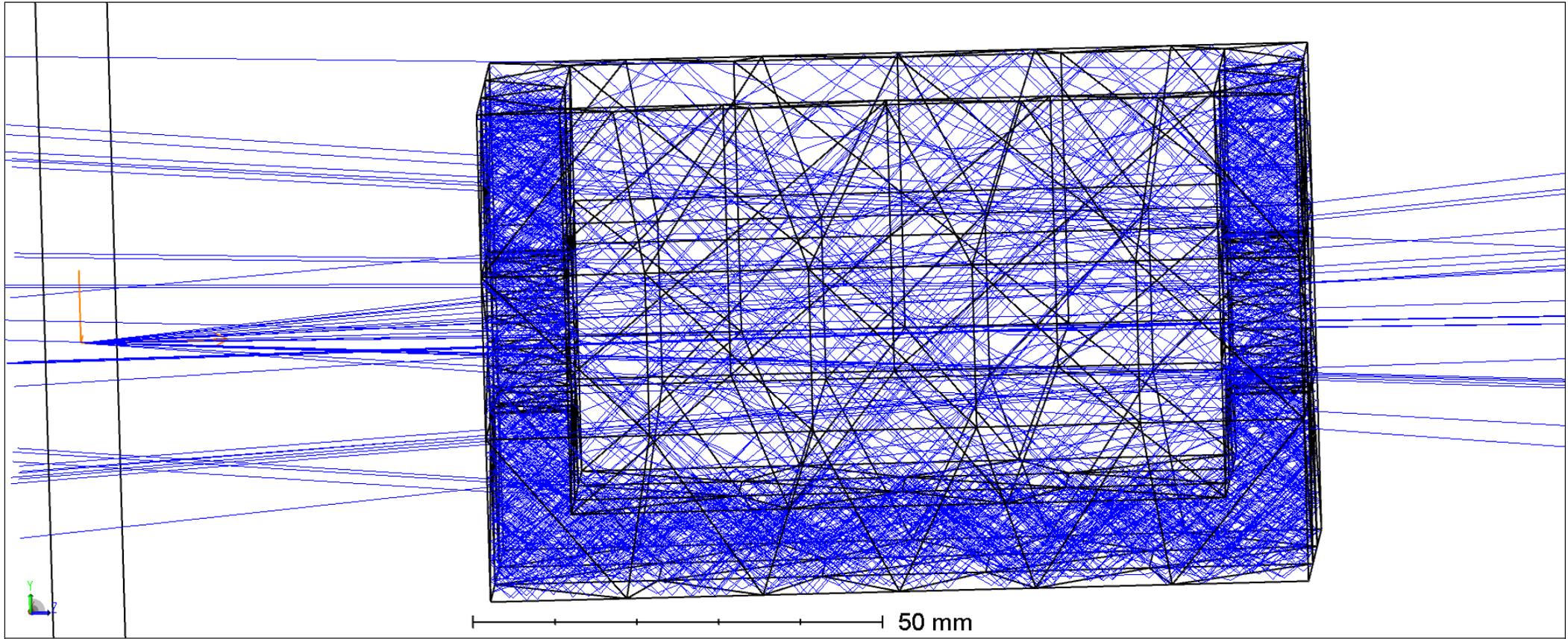
Modelling of UV LED test system water tank

1. Using sequential ray tracing;
2. I am generating the real tank using Boolean operations;
3. Tank exported as STL file (several other CAD formats available);
4. Rays traced at a single wavelength at 450 nm;
5. Simulations were carried out using ZEMAX OpticStudio Professional V22.2 on my home PC (Gen 11 i5 6/12 core @4.3 GHz sustained average, 32 Gbytes of 3200 MHz DDR4 memory).

Overall view of system, normal volumes



Overall view of system Boolean volume



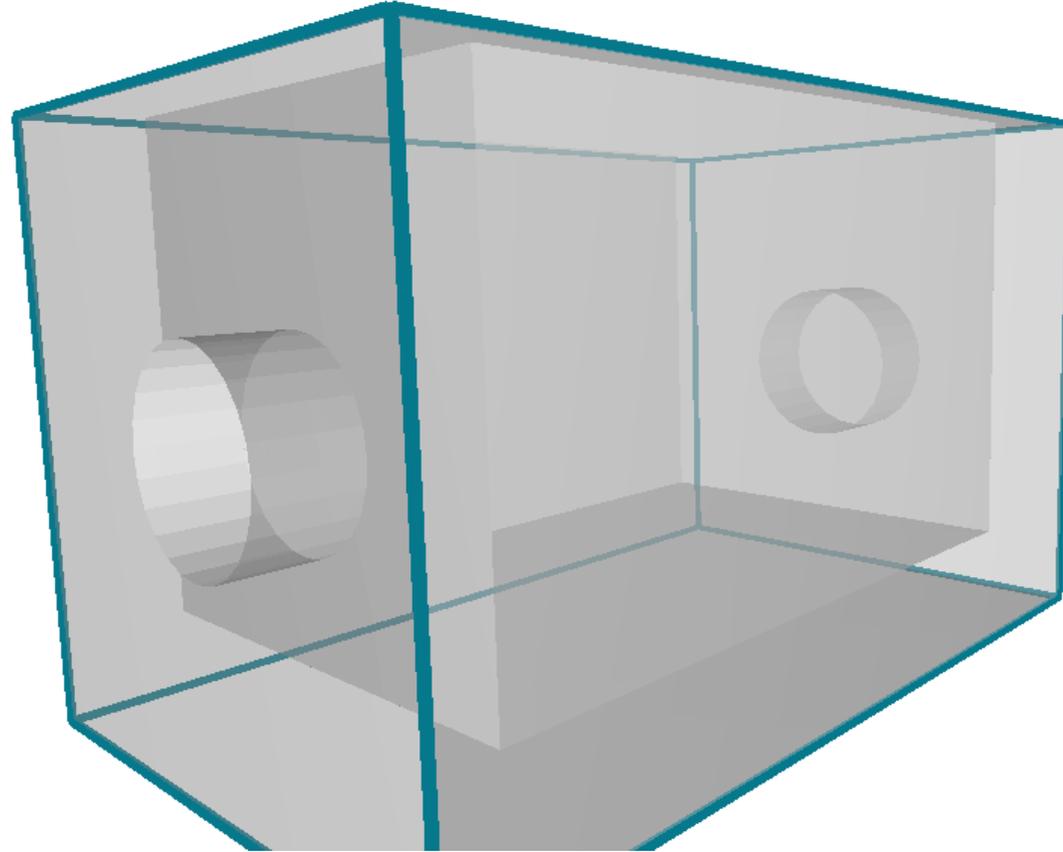
3D Layout

02/06/2023

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Boolean_test1.zos
Configuration 1 of 1

Overall view of system STL CAD export



To do list!

1. Use this STL file, with correct dimensions, in the non-sequential ray trace.
2. Understand the challenges of the trapped rays (a typical feature of rectangular geometry) in terms of simulation time and accuracy.
3. I'd like to know if you would find the STL (or other format) file useful. For the real phantom the ability to import a CAD file into ZEMAX would be very valuable.