SmartPhantom Simulation Requirements

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1 SmartPhantom Detector

The detector is composed of scintillating fibres; clear plastic light-guides; light detector, e.g. photo-diodes; readout system that will digitise the signal from the photo-diodes. Schematics of the tank is given in Figure 1 and the fibres planes in Figure 2. The simulation will need to be detailed enough to include fine geometry details such as

- individual fibres and the glue between them (optionally loaded with a reflective material like TiO2). See Figure 3.
- details of the coupling of the scintillating fibres to the clear light-guide fibres (including connectors, optical grease, etc.)
- Details of the readout geometry (to determine the scintillation light that interacts with the sensitive part of the photo detector)
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Details of the simulation needed to determine the performance of the detector:

- Accurate simulation of the scintillation light (yield and transmission down light-guides.
- simulation of the photo-detector response to scintillation light item simulation of the digitisation of the read out electronics.

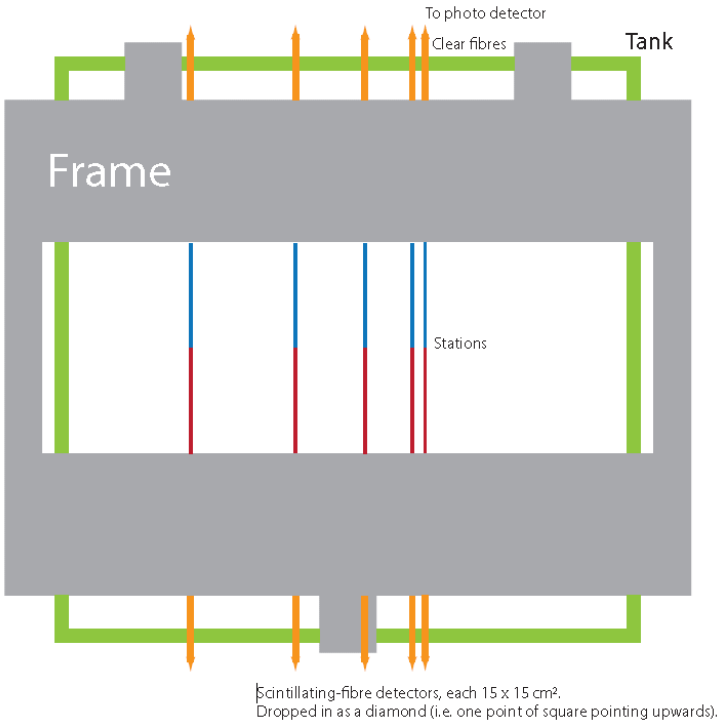

Figure 1: Schematic of the SmartPhantom tank showing the fibre plane arrangement.

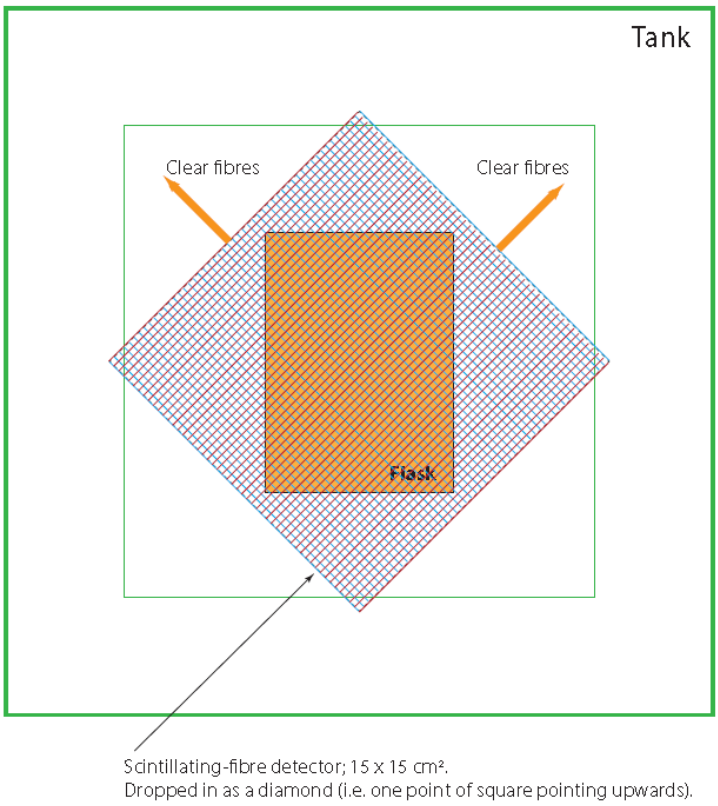

Figure 2: Schematic of a detector plane

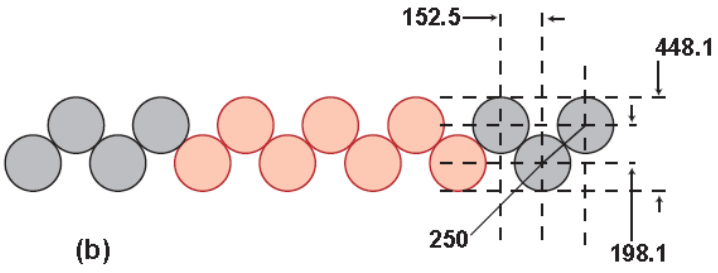

Figure 3: Arrangement of fibres to be glued together