# Update on Markov chain Monte Carlo photon path generation

Martijn Jongen 18 May 2016

# **Reference Model**

- Nanobeacon (isotropic) at origin
- DOM on z-axis @ 37 m
- Different PMT zenith angles (1 for each ring):
  - Ring F: 56
  - Ring E: 73
  - Ring D: 107
  - Ring C: 124
  - Ring B: 148
  - Ring A: 180

NOTE: 0 degrees is upwards along the positive z-direction, so the angle w.r.t. the target is 180 minus this

source: detector file, angles rounded to whole degrees

# Nanobeacon pulse shape

- Based on run #494 (L0)
- Gaussian fits of pulse shapes of PMTs in ring B two DOMs above the NB
  - not overilluminated
  - but contain some scattered light already
- Assuming Gaussian pulse, width 2.6 ns (~average over ring B)



### Data comparison

- Run #494
- DU-2 L0
- NB on DOM3
- Look at DOM4

#### Data comparison

Run #494



### Data comparison, zenith 124 deg

Arrival time distribution ×10<sup>-6</sup> nscat = 0 0.12 nscat = 1 nscat = 2 nscat = 3 0.1 nscat = 4 nscat = 5 data, Ch. 0 0.08 data, Ch. 4 data, Ch. 5 data, Ch. 7 0.06 data, Ch. 8 data, Ch. 9 0.04 ··· total 0.02 lt i fau 0 200 300 400 500 600 700 t [ns]

#### Data comparison, zenith 124 deg



a.u.