# Looking for Gamma-X events in LZ simulations

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Gamma-X events

Qualitative representation of a gamma-X event. (Left) A γ scatters multiple times in the active region, with a single vertex in the drift region (small blue) and one or more vertices under the cathode (red). The resulting signal is shown at right as a function of time. The measured S1 signal is a composite signal from all vertices. Ionization is not collected from the vertices under the cathode. The resulting event has a single S2 which has a contribution only from the drift region vertex (large blue). (Right) The resulting waveform with detected S1 and S2 signals (black dashed). Shown are the contributions from the drift region vertex (blue) and RFR vertex (red). The reduced S2/S1 ratio for the event greatly lowers discrimination efficiency.

(Malling 2014)
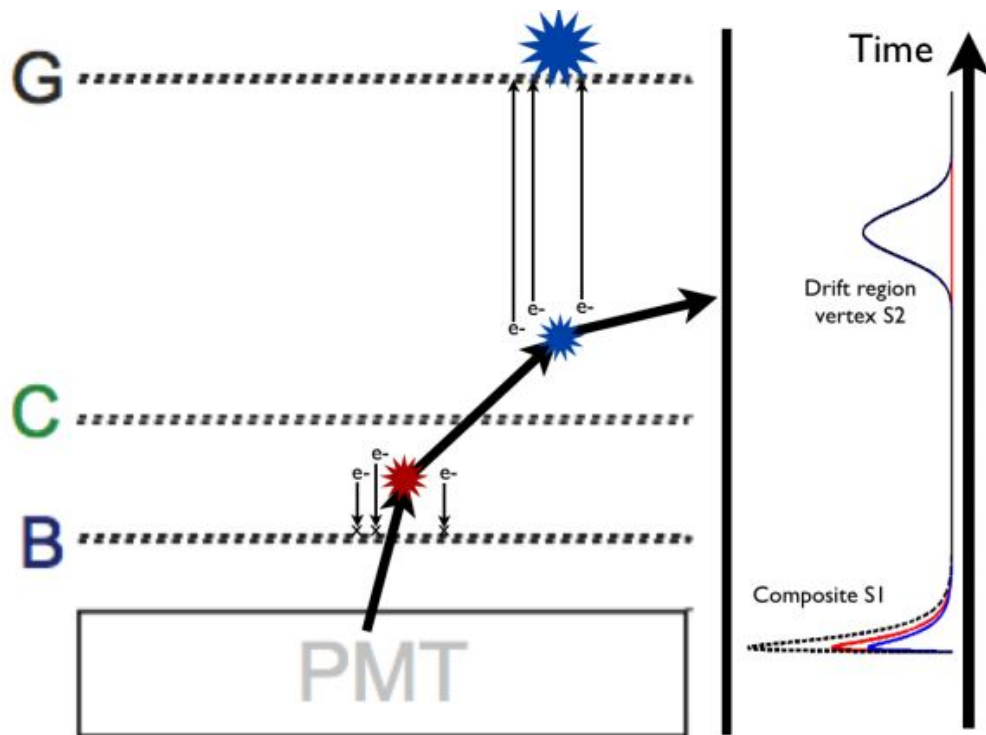
Simulation Procedure

Simulations are run using the BACCARAT front-end to Geant4

The events are output as ROOT files

The analysis is then done in Python using rootpy