TECSS Algorithm

- Algorithm loops over TEC arms, sectors, planes and Z-sides. If GEANT hit is found in one of the planes, track entry and exit coordinates and total track length in this plane are calculated.
- The range of wires which were fired by the particle is calculated. This is done differently for planes with even and odd number of wires.
- Algorithm loops over wires that fired. For each wire cell track entry and exit coordinates are calculated. A fraction of the track which belongs to this wire cell is also calculated. Straight line tracks are assumed.
- Track is divided into small parts, each part corresponding, approximately, to one time bin. Algorithm loops over those track parts.
  - Average number of primary ion collisions for each track part is calculated according to *V.K.Ermilova et al., Sov. Phys. JETP, 29(1969) p.861.* Fluctuations of the number of primary collisions are well described by Poisson statistics (see e.g. *F.Sauli, CERN Preprint 77-09, May 1977*).
  - Secondary ionization is calculated by generating spectrum of δ-electrons using following equation (see *F.Sauli, CERN Preprint 77-09, May 1977*):

    $$P(E) = Const \cdot E^{-2}$$

    Where $P(E)$ is the probability to create delta-electron with the energy E. Number of secondary ion pairs created by delta-electron is assumed to be proportional to this energy. Proportionality coefficient is taken from *F.Sauli, CERN Preprint 77-09, May 1977*, so that the average number of secondary ion pairs per one primary δ-electron is the same as is measured in experiments.
  - Total number of Primary+Secondary Ion pairs is calculated and the distance iof the electron cluster to the wire and drift time are calculated assuming straight line drift.
  - Gas gain fluctuations are simulated using Polya distribution with parameter 1.5 (*R.Bellazzini and M.A.Spezziga, INFN PI/AE-94/02*).
  - Noise is added. Amount of noise is determined by the value of input parameter dTecSlowSimPar[0].Noise.
  - Electronics shaping time is reproduced using TEC time responce function by V.Cherniatin (*cherniat@bnlarm.bnl.gov*).
  - Charge collected on the wire as a function of time bin is calculated. Digitisation is done using following charge-to-channel conversion: First 11 channels have width 2 fC/channel, next 18 channels have width 4 fC/channel, and last 3 channels have width 100 fC/channel. Saturation is at 31 channel.
- Data table dTecFemData and relational table dTecGhitRaw are filled.