

Multiple Scattering

- Summarizing, the covariance matrix is

$$V = \begin{pmatrix} \sigma_i^2 & 0 & 0 \\ 0 & \sigma_j^2 & 0 \\ 0 & 0 & \sigma_k^2 \end{pmatrix} + \begin{pmatrix} 0 & 0 & 0 \\ 0 & (z_j - z_i)^2 \delta\theta_i^2 & (z_k - z_i)(z_j - z_i) \delta\theta_i^2 \\ 0 & (z_k - z_i)(z_j - z_i) \delta\theta_i^2 & (z_k - z_i)^2 \delta\theta_i^2 + (z_j - z_i)^2 \delta\theta_j^2 \end{pmatrix}$$

- The second matrix has
 - Diagonal elements due to any previous material affecting the trajectory impact point at the given plane
 - Off diagonal elements: only presents if a previous material layer affects at the same time the trajectory impact points for the 2 planes
- The same scattering at plane i
- Affects the trajectory at plane j and plane k

