Simulation of particle spectra and the creation of the lookup table

Collect a set of $i_L$, $n_L$, and $p_L$ by iterating through all realistic combinations of $i$, assuming a gamma size distribution.

Input:

$$i_L = (\text{particle type, } p, T, \sigma_{\text{total}}, D_m, \mu)$$

Normals:

$$n_L = (N_1, F_1, Z_1, E_1)_L$$

Size/shape properties:

$$p_L = (v_t, w, Z/E)_L$$

(a)

Look up a result

Create space with a combination of the coordinates (here: $v_t$ and $w$) and fill with the corresponding vectors $n_L$ and $i_L$.

Calculate the distribution of the matching probability in $(v_t, w)$ space against vector $m=(v_{t,M}, w_M)$ measured with errors.

(b)

Scale normal vectors and combine with $P$

Retrieve vectors $r_L$ of extensive properties by scaling each normal vector of the lookup table with measured $Z_M$ and the simulated $Z_1$ so that $r_L = n_L (Z_M / Z_1)$.

Plot an element of all vectors $r_L$ vs matching probability $P$ (example for number concentration).

(c)