L = Length of edge (cropped length)

$$L = \sqrt{\frac{A}{F}}$$

A = area of a particle

$$\text{Box Area} = A/F$$

$$A = \frac{\pi D^2}{4}$$

$$F = \frac{\Sigma \text{ Areas of Particles}}{\text{Box Area}}$$

D = Diameter of particle

$$\text{Probability of Particle on Edge} = P = \frac{D}{\sqrt{A/F}}$$

$$\text{Area per unit of Length} = Al = \frac{P A}{\sqrt{A/F}} = F \cdot D$$

$$n_l(D) = \sum_{D=1,2\ldots} \frac{FD}{A} = \Sigma \frac{4F}{\pi D}$$

$$\log(N(x)) = -m\left(\log^2(x) - \log^2(L)\right)$$

Standards → Bin → $n(x) = N(x) - N(x+1)$

$$F = A(x)\, n(x)$$

$$n_l = \frac{\sum_{x=1}^{4} F_x(x)}{\pi x}$$

# of Particles per unit of Length

$N_{edge} = n_l \cdot$ Length of edge

Sum of Area (Trial x, Sample y) at diameter z

Sum area

$\sum A_{xyz}$ $\quad x = 6, 7, 8, 9$

x = Trial $\quad y = 1, 2, 3, 4, 5$

y = Sample $\quad z = 1 \ldots$ Max(Diameter)

z = Particle Diameter

$$M_{xyz} = \sum A_{xyz} \cdot (0.1 / \alpha_{xy}) \qquad \alpha = \text{total Area of Sample } y \text{ trial } x$$

$$D_{xyz} = M_{xyz\ after} - M_{xyz\ before}$$

$$D_{xyz} \sim \begin{cases} D_{xyz} & D > 0 \\ 0 & D \leq 0 \end{cases}$$

$$M_{xz} = \frac{\sum D_{xz} \text{ over } y}{y}$$

$$N_{xz} = \frac{\mu_{xz}}{a_x}$$

a_x = Total Area of Trial ($0.1\ m^2$)

$x = x+1$ $\quad x = 1$

$$C_{xz} \frac{N_{xz} \cdot 4}{\pi \cdot z^2} ?$$

$= nl$

$$C_{xz} = \sum_{z>i} C_{xz_i}$$

$$E_{xz} = C_{xz} \cdot \left(L/n\right) ?$$

z = Largest Length value

n = Total Images

$F_a(x)$ = Sum of the Area of all the paritles with a diameter of z and in trial x

$\simeq$ Mean of the sum Area of all the paritles with a diameter of z and in trial x and Samples 1-5

Area of the trial Images

$\simeq (0.1\ m^2)$