SEM - resolution

Topography imaging (secondary electrons):

Resolution = electron beam diameter = d

$$d = \sqrt{\frac{i}{E}\frac{a}{r}}$$

i =   **beam current (probe current, spot size):** $10^{-12} - 10^{-6}$ **A**

E=   **acceleration voltage : 5-20kV**

a=   **working distance (distance between objective lens and specimen) ; 5-50mm**

SEM – depth of field

Depth of field = maximum difference in height where an image of a specimen is in focus = D

$$D = \left(\frac{\delta}{M} - d\right)\frac{a}{r}$$

δ = resolution of the eye = 0.1mm

a =   **working distance : 5-50mm**

r =   **aperture radius (typical 3-4 values)**