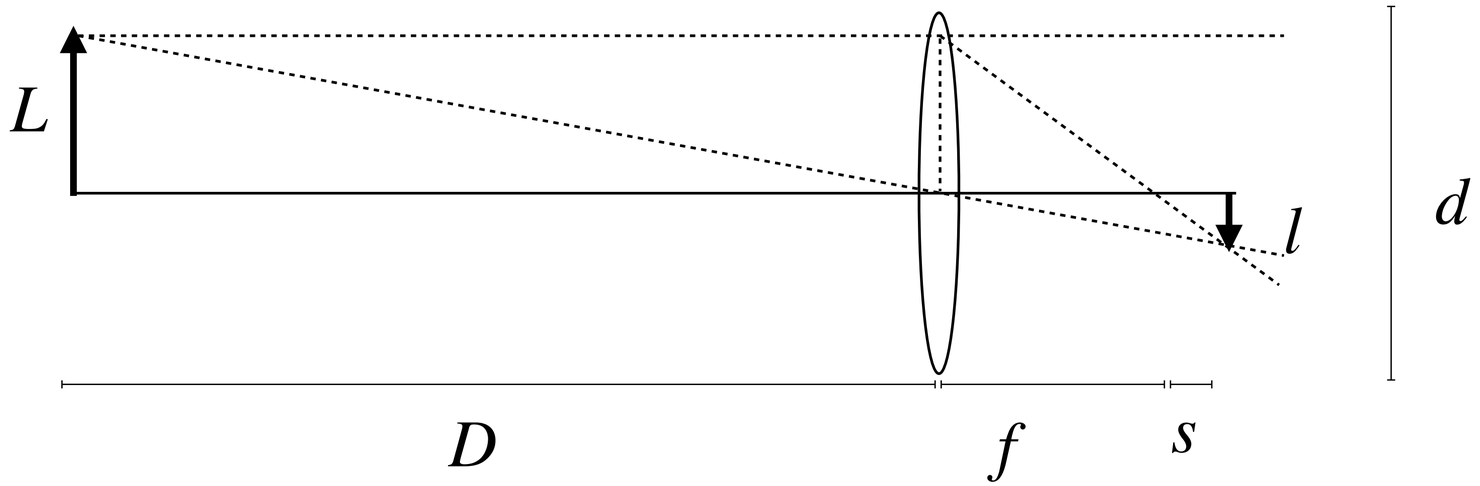

L = side of area to acquire

l = side of sensor

d = lens effective diametre

D = lens-object distance

f = lens focal length

$\frac{f}{d}$ = # = lens aperture

$\frac{l}{L}$ = de-magnification

$$\frac{L}{f} = \frac{l}{s} \Rightarrow s = \frac{l}{L} f$$

$$\frac{L}{D} = \frac{l}{(f+s)} = \frac{l}{(f+\frac{l}{L}f)} \Rightarrow$$

the distance needed to acquire an area with a side L is $D = (\frac{L}{l} + 1)\, f$

The fraction of photons that are collected is

$$\epsilon = \frac{\pi(d/2)^2}{4\pi D^2} = \frac{d^2}{[4f((L/l)+1)]^2} = \frac{1}{[4\#((L/l)+1)]^2}$$