(2.) 1D Image

$$g = h * f \quad \text{(Assume no noise)}$$

take F.T., $G = H F$ (Convolution theorem)

$$\therefore \hat{F} = G/H = F$$

$$\hat{f}(x,y) = \mathcal{F}^{-1}(\hat{F})$$

If H is zero, there is a problem in estimating F. Otherwise this task is completely well-defined.

Now, assume that there is some unknown noise.

$$g(x,y) = (h * f)(x,y) + \eta(x,y)$$

take F.T.,

$$G(u,v) = H(u,v)\,F(u,v) + N(u,v)$$

$$\hat{F}(u,v) = G(u,v) / H(u,v)$$

$$F(u,v) = G(u,v) / H(u,v) - N(u,v) / H(u,v)$$

$$\hat{F}(u,v) \neq F(u,v).$$

If $H(u,v)$ has small values (this will happen for higher frequencies i.e. higher values of u & v, if $h(x,y)$ is a blur kernel i.e. a low-pass filter), the corresponding estimates of $F(u,v)$ will be highly erroneous if there is even a tiny amount of noise.