▪ IMPROVED RECONSTRUCTION VIA CORRECT COMPUTATION OF AREAS FOR "RAY-MESH INTERSECTION"
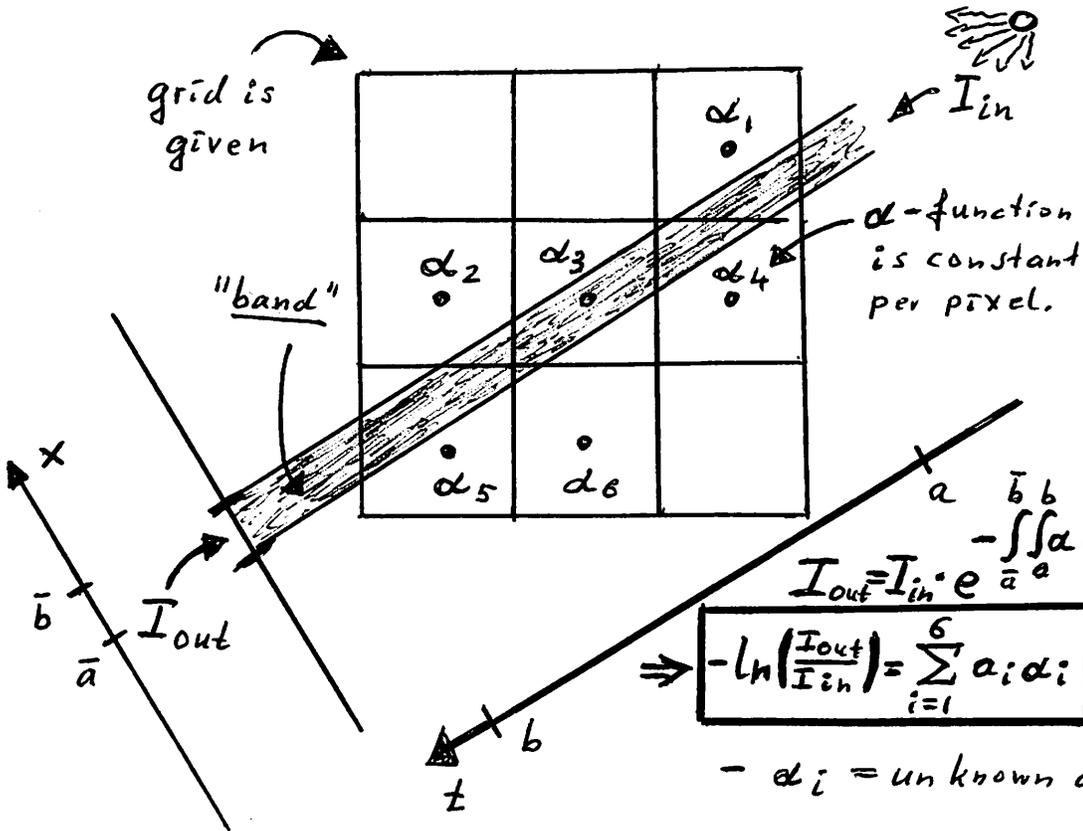
➤ Consider only simple absorption model:

grid is given

"band"

α_1 I_{in}

α-function is constant per pixel.

α_2 α_3 α_4

α_5 α_6

I_{out}

X

$\bar{b}$

$\bar{a}$

$\bar{b}$ b

a

t

b

$$I_{out} = I_{in} \cdot e^{-\int_{\bar{a}}^{a}\int_{a}^{\bar{b}\,b} \alpha(t,x)\ldots}$$

$$\boxed{-\ln\left(\frac{I_{out}}{I_{in}}\right) = \sum_{i=1}^{6} a_i \alpha_i}$$
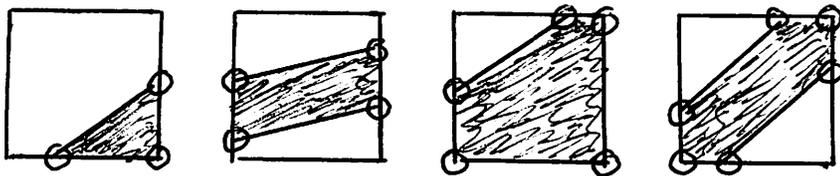
- pixel with non-zero intersection with "band"

– number of "bands":

720 angles × 1024 per angle

= 720 × 1024

- α_i = unknown absorption coefficients

- a_i = intersection area of band and pixel

➤ Need to handle all cases of BAND-PIXEL intersection:

(i) Intersection is zero or intersection is entire pixel

(ii) Intersection is polygonal region, obtained by CLIPPING band against pixel

⟸ possible polygons resulting from intersection

⟹ compute areas via triangulation!
OR: Green's Theorem!

⟹ For example, use Sutherland-Hodgman algorithm for polygon clipping producing the vertex set {0}

! (iii) Intersection is corner or edge of pixel.!

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