





$$\sigma = \frac{T_{\text{sys}}}{\eta_{\text{spec}} \sqrt{dv} t},$$













$$\sigma = \sqrt{\sigma_{\text{on}}^2 + \sigma_{\text{off}}^2} = \frac{T_{\text{sys}}}{\eta_{\text{spec}} \sqrt{d\nu} t_{\text{sig}}} \quad \text{with} \quad t_{\text{sig}} = \frac{t_{\text{on}} t_{\text{off}}}{t_{\text{on}} + t_{\text{off}}},$$













$$T_{sys} = \frac{(1 + G_{im}) \exp \{ \tau_s A \}}{F_{eff}} [F_{eff} T_{atm} (1 - \exp \{ -\tau_s A \}) + (1 - F_{eff}) T_{cab} + T_{rec}],$$







Adrianus





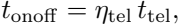












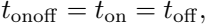




pop1



$$\sigma = \frac{T_{\text{sys}}}{\eta_{\text{spec}} \sqrt{dv} \, n_{\text{pol}} \, t_{\text{sig}}} \quad \text{with} \quad t_{\text{sig}} = \frac{t_{\text{on}} \, t_{\text{off}}}{t_{\text{on}} + t_{\text{off}}}.$$



$$t_{sig} = \frac{t_{on}}{2} = \frac{t_{off}}{2} = \frac{t_{onoff}}{2},$$



$$\sigma_{\text{fsw}} = \frac{\sqrt{2} T_{\text{sys}}}{\eta_{\text{spec}} \sqrt{dv} \, \eta_{\text{pol}} \, \eta_{\text{tel}} \, t_{\text{tel}}} .$$

$$t_{on} = t_{off} = \frac{t_{onoff}}{2},$$

$$t_{sig} = \frac{t_{on}}{2} = \frac{t_{off}}{2} = \frac{t_{onoff}}{4},$$

$$\sigma_{\text{psw}} = \frac{2 T_{\text{sys}}}{\eta_{\text{spec}} \sqrt{d\nu} \, \eta_{\text{pol}} \, \eta_{\text{tel}} \, t_{\text{tel}}} .$$



The image displays the word "Amp" in a highly pixelated, grayscale font. The letters are composed of various shades of gray, creating a blocky, digital appearance. The 'A' is on the left, followed by 'm', 'p', and 'p'. The overall style is reminiscent of early computer graphics or low-resolution digital art.

1990





$$A_{\text{beam}} = \frac{n_{\text{grid}} \pi \theta^2}{4 \ln(2)}$$





$$n_{grid} = 1 + \frac{1}{9} \approx 1.11.$$



$$n_{\text{beam}} = \frac{A_{\text{map}}}{A_{\text{beam}}}.$$

beard

od

beard



beedoo  
ai

$$t_{\text{sig}}^{\text{beam}} = \frac{t_{\text{on}}^{\text{beam}} t_{\text{off}}^{\text{beam}}}{t_{\text{on}}^{\text{beam}} + t_{\text{off}}^{\text{beam}}}$$





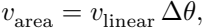


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ECONOMICS  
AND BUSINESS





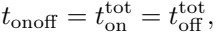








$$\frac{\theta}{2.5}$$



$$t_{\text{beam on}} = t_{\text{beam off}} = \frac{t_{\text{onoff}}}{n_{\text{beam}}};$$

$$t_{\text{sig}}^{\text{beam}} = \frac{t_{\text{on}}^{\text{beam}}}{2} = \frac{t_{\text{off}}^{\text{beam}}}{2} = \frac{t_{\text{onoff}}}{2n_{\text{beam}}},$$

$$\sigma_{\text{fsw}} = \frac{\sqrt{2} \, n_{\text{beam}} \, T_{\text{sys}}}{\eta_{\text{spec}} \sqrt{d\nu} \, n_{\text{pol}} \, \eta_{\text{tel}} \, t_{\text{tel}}} .$$

$$\frac{A_{\text{map}}}{t_{\text{onoff}}} \leq v_{\text{area}}^{\text{max}}.$$



optimal  $\geq$  von Neumann  $\geq$  cod

WORLDWIDE

$$t_{\text{sig}} = \frac{t_{\text{on}}}{1 + \frac{1}{\sqrt{n_{\text{on/off}}}}} \quad \text{and} \quad \sigma = \frac{T_{\text{sys}}}{\eta_{\text{spec}} \sqrt{d\nu} n_{\text{pol}} t_{\text{on}}} \sqrt{1 + \frac{1}{\sqrt{n_{\text{on/off}}}}}.$$

Alvin Karp

www.fox.com

spiral

www.vivipedia.org









$$n_{\text{submap}} = \frac{A_{\text{map}}}{A_{\text{submap}}} \cdot$$

$$n_{\text{on/off}} = \frac{A_{\text{submap}}}{A_{\text{beam}}}.$$

Handwritten text in a cursive script, likely a signature or name, rendered in grayscale. The text is split across three segments by two horizontal lines. The first segment contains the word "Hand", the second segment contains the word "written", and the third segment contains the word "in". The script is fluid and characteristic of 18th or 19th-century handwriting.

Alvin Brown  
—  
Alfred Brown.

Evbbaap=voovt

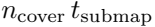
$$t_{\text{on}}^{\text{beam}} = n_{\text{cover}} t_{\text{on}}^{\text{cover}} \text{ and } t_{\text{off}}^{\text{beam}} = n_{\text{cover}} t_{\text{off}}^{\text{cover}} \text{ with } t_{\text{off}}^{\text{cover}} = \sqrt{n_{\text{on}}/n_{\text{off}}} t_{\text{on}}^{\text{cover}}.$$



$$t_{\text{sig}}^{\text{beam}} = n_{\text{cover}} t_{\text{sig}}^{\text{cover}} = \frac{n_{\text{cover}} t_{\text{submap}}}{n_{\text{on/off}} + \sqrt{n_{\text{on/off}}}}.$$

$$t_{\text{onoff}} = n_{\text{cover}} \text{submap} (n_{\text{on}} / \text{off} t_{\text{on}} + t_{\text{off}} + t_{\text{cover}}).$$

$$t_{\text{onoff}} = n_{\text{cover}} t_{\text{submap}} n_{\text{submap}} \left( 1 + \frac{1}{\sqrt{n_{\text{on/off}}}} \right).$$



$$t_{\text{onoff}} = t_{\text{beam}} \sqrt{\nu_{\text{submap}} \left( 1 + \sqrt{\nu_{\text{onoff}}} \right)^2}.$$

$$t_{\text{onoff}} = t_{\text{sig}} \left( \sqrt{n_{\text{vibmap}}} + \sqrt{n_{\text{beam}}} \right)^2.$$

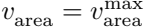
$$\sigma_{\text{psw}} = \frac{(\sqrt{n_{\text{beam}}} + \sqrt{n_{\text{submap}}}) T_{\text{sys}}}{\eta_{\text{spec}} \sqrt{dv} \eta_{\text{pol}} \eta_{\text{tel}} t_{\text{tel}}} .$$

Adaptation

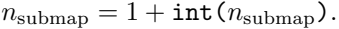


$$n_{\text{submap}} = \frac{A_{\text{map}}}{v_{\text{area}} t_{\text{submap}}}.$$





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evbvdap v ap v abe v ax  
aree



$$t_{\text{sig}}^{\text{beam}} = \frac{T_{\text{sys}}^2}{\eta_{\text{spec}}^2 \sigma^2 dv n_{\text{pol}}},$$





$$t_{\text{onoff}} = t_{\text{sig}} \left( \sqrt{n_{\text{vibmap}}} + \sqrt{n_{\text{beam}}} \right)^2,$$



1991-1992

$$n_{\text{on/off}} = \frac{n_{\text{beam}}}{n_{\text{submap}}},$$

$$n_{\text{cover}} = \frac{t_{\text{sig}}^{\text{beam}}}{t_{\text{submap}}} \left( n_{\text{on/off}} + \sqrt{n_{\text{on/off}}} \right) ,$$

$$t_{\text{on}}^{\text{beam}} = \frac{n_{\text{cover}} t_{\text{submap}}}{n_{\text{on/off}}}$$

beam  
off



beam  
on

beam  
on/off







Answer to the question



$$\sigma_{\text{fsw}} = \frac{\sqrt{2} \, n_{\text{beam}} \, T_{\text{sys}}}{\eta_{\text{spec}} \sqrt{d\nu} \, n_{\text{pol}} \, \eta_{\text{tel}} \, t_{\text{tel}}},$$

$$\sigma_{\text{psw}} = \frac{(\sqrt{n_{\text{beam}}} + \sqrt{n_{\text{submap}}}) T_{\text{sys}}}{\eta_{\text{spec}} \sqrt{dv} \eta_{\text{pol}} \eta_{\text{tel}} t_{\text{tel}}} .$$

$$\frac{\sigma_{\text{psw}}}{\sigma_{\text{fsw}}} = \frac{1}{\sqrt{2}} \left( 1 + \sqrt{\frac{n_{\text{submap}}}{n_{\text{beam}}}} \right) .$$

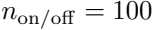
$$\frac{n_{\text{beam}}}{n_{\text{submap}}} = n_{\text{on/off}} \geq \frac{1}{3 - 2\sqrt{2}} \sim 6.$$



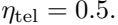
QWERTYUIOPASDFGHJKLZXCVBNM

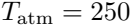
WORLDWIDE





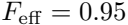
$$n_{\text{on/off}} = \frac{t_{\text{stable}}}{A_{\text{beam}}/v_{\text{area}}^{\text{max}}},$$











1992

2000

2001



WILL

—

Q1

100%





2460'



VGHS





$$v_{linear}^{max} = f_{dump} \frac{\theta}{4} \text{ arcsec/s}$$

$$v_{\text{area}}^{\text{max}} = f_{\text{dump}} \frac{\theta}{2.5} \frac{\theta}{4} \text{arcsec}^2/\text{s} \quad \text{or} \quad v_{\text{area}}^{\text{max}} = f_{\text{dump}} \frac{\theta^2}{10} \text{arcsec}^2/\text{s}$$





$$t_{\text{onoff}} = t_{\text{on/off}} + t_{\text{off}} = (t_{\text{on/off}} + t_{\text{off}})$$

$$t_{\mathrm{onoff}} = \frac{T_{\mathrm{sys}}^2}{\eta_{\mathrm{spec}}^2 \sigma^2 \, dv} \left( 1 + n_{\mathrm{on/off}} + \alpha + \frac{n_{\mathrm{on/off}}}{\alpha} \right).$$

$$\frac{dt_{\text{on/off}}}{d\alpha}$$

$\propto$

1

—

$$\frac{r_{\text{on/off}}}{\alpha^2}$$

$$a = \sqrt{n_{\text{on/off}} \text{ or } t_{\text{off}}^{\text{optimal}}} = \sqrt{n_{\text{on/off}} t_{\text{on}}}.$$