Problem(a) 2

$T_{eq} = 1250$

PRF = 1200;
n = 20;

Número de impulsos
number of pulses = 20;

$\tau = 1 \times 10^{-6}$; $B = 1/(2\,\tau)$; $\Delta f = B \rightarrow 500\,\text{kHz}$

$P_T = 20 \times 10^3$

$\lambda = 0.111\ \text{m}$ $(f = 2.7\,\text{GHz})$

$G = 10^{3.3}$

$\sigma av = 10\,\text{m}^2$

$K = 1.38 \times 10^{-23}$

Se não existissem flutuações, consultar tabela → SNR1sf=15.1dB
If there were no fluctuations, see table → SNR1sf=15.1dB

$SNR1sfdB = 15.1$; $SNR1sf = 10^{SNR1sfdB/10}$; $SNR1n = SNR1sf/n \rightarrow 1.62$

Distância máxima sem flutuações
Maximum distance in the case of no fluctuations

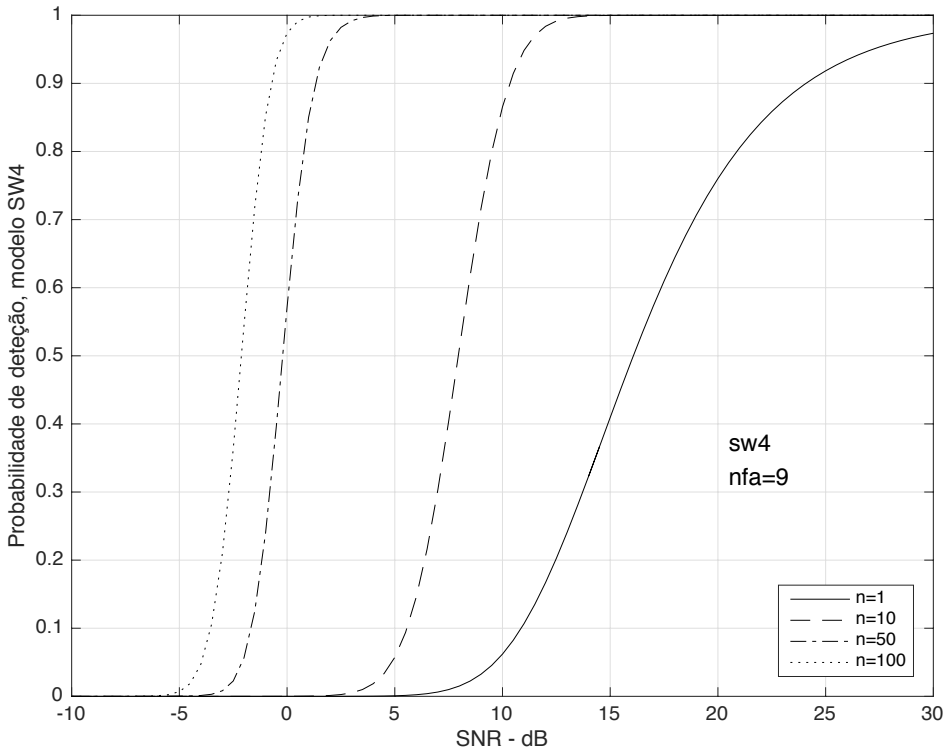
$$Rmaxsf = \left(\frac{PT\,\lambda^2\,G^2\,n\,\sigma av}{(4\,\pi)^3\,K\,Teq\,\Delta f\,SNR1sf} \right)^{1/4}$$

$\rightarrow 137.3\,\text{km}$

Nas hipóteses do enunciado,
According to the hypothesis in the text → SW4

$$Rmax = \left(\frac{PT\,\lambda^2\,G^2\,\sigma}{(4\,\pi)^3\,K\,Teq\,\Delta f\,SNR1,\,20} \right)^{1/4}$$

(* SW4 gráfico / Graphics *)



;

$SNR1dB = 6.5; SNR1 = 10^{SNR1dB/10} \rightarrow 4.47$

$$Rmax = \left(\frac{PT\,\lambda^2\,G^2\,\sigma av}{(4\,\pi)^3\,K\,Teq\,\Delta f\,SNR1} \right)^{1/4} \rightarrow 106.5\,km$$

Problem(a) 3

$v = 20/3.6\ ms^{-1}$ (5.556)

$fd = 2\ v/\lambda \rightarrow 100\ Hz$

$fp = 3000; k = 0.5;$

$$H2(f) = \frac{2\,(1 - Cos\,(2\,\pi\,f\,/fp))}{\left(1 + k^2\right) - 2\,k\,Cos\,(2\,\pi\,f/fp)} \rightarrow 0.16 \quad (-10.4\,dB)$$