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To: EDGES Group
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 Subject: EDGES Noise

The theoretical 1-Sigma noise for EDGES is given by

$$\sigma = \left(a^2 + b^2 + c^2 \right)^{1/2} (BT/3)^{-1/2} \quad K$$

Where $a = T_s + T_R$

$$b = (T_s - T_L)(T_L + T_R) / T_{cal} - T_R - T_L$$

$$c = -(T_s - T_L)(T_L + T_R) / T_{cal} + T_L - T_s$$

T_s = sky temperature

T_L = load temperature

T_R = receiver temperature

T_{cal} = noise calibration temperature

B = resolution bandwidth

T = total integration time

$T/3$ = integration time in each position of the 3-position cycle

For $T_s = T_L = T_{cal} = 300K$, $T_R = 100K$, $B = 400$ kHz and $T = 100$ hrs the theoretical rms noise is 2.6 mK.

For $T_s = 1700$, $T_R = 200$, $T_L = 300$ and $T_{cal} = 1000$ the rms is 13 mK. The systems in the field are 50% efficient so that for 100 hrs of actual time the theoretical number are about 3.7 and 18 mK for high and low band respectively.