

## Direct Detection Sensitivities

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### Summary:

230Rx: 12% beam maps , 0.5% for FTS

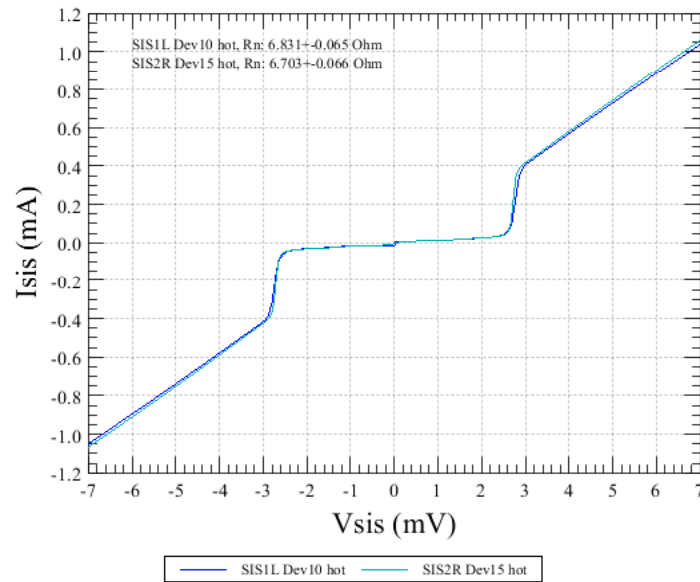
345Rx: 8 % beam maps , 0.5% for FTS

460Rx: 10 %beam maps , 0.35% for FTS

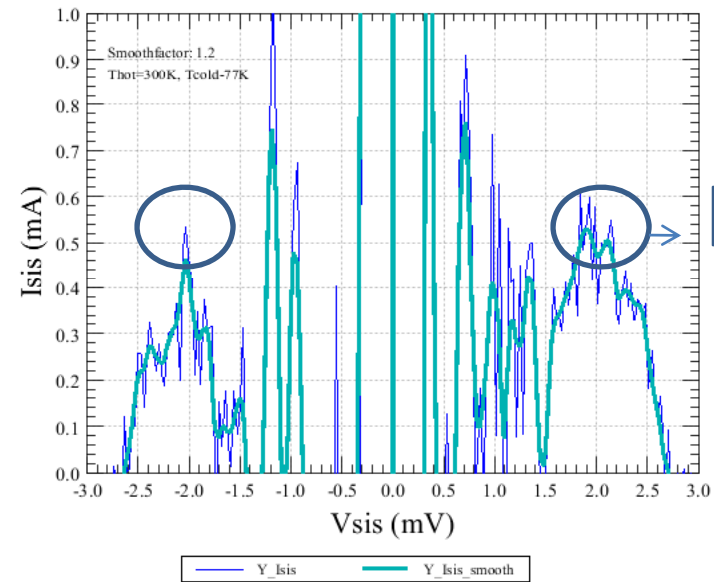
650Rx: 8 % beam maps , 0.10% for FTS

## 230 Balanced Mixer(Bfield Setting not quite Optimized)

Measured I/V, T=4.51K

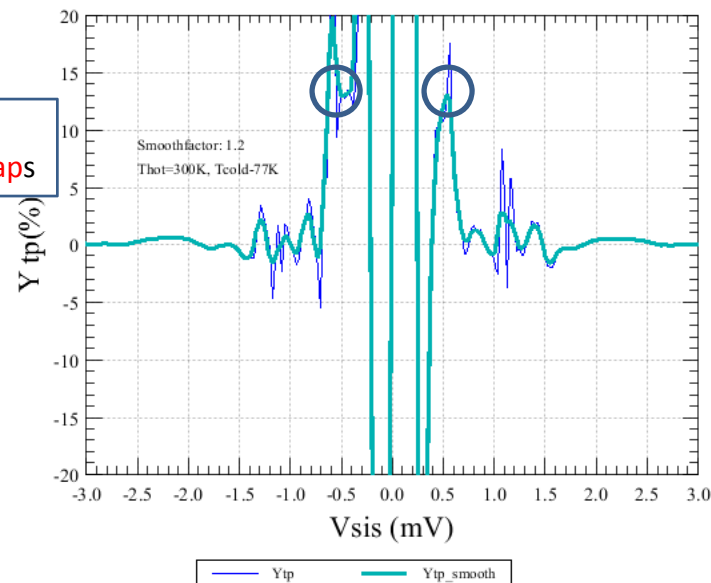


Y\_Isis (%)



0.5% for FTS

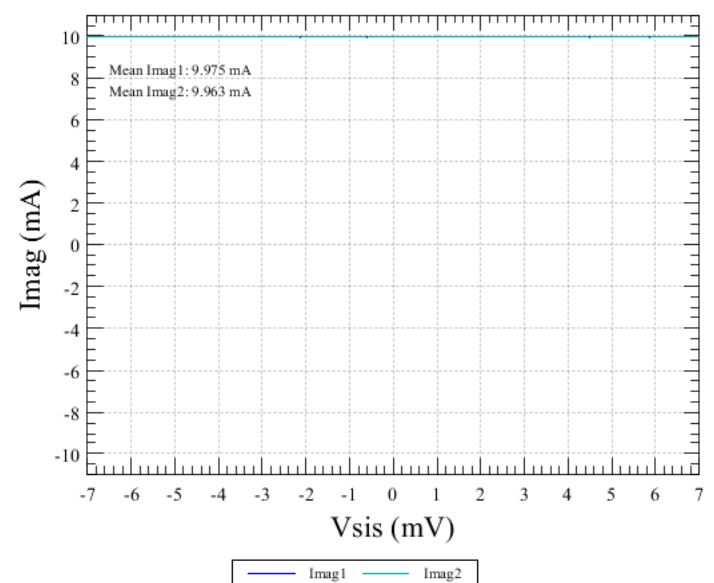
Y\_tp (%)



12%  
For beam maps

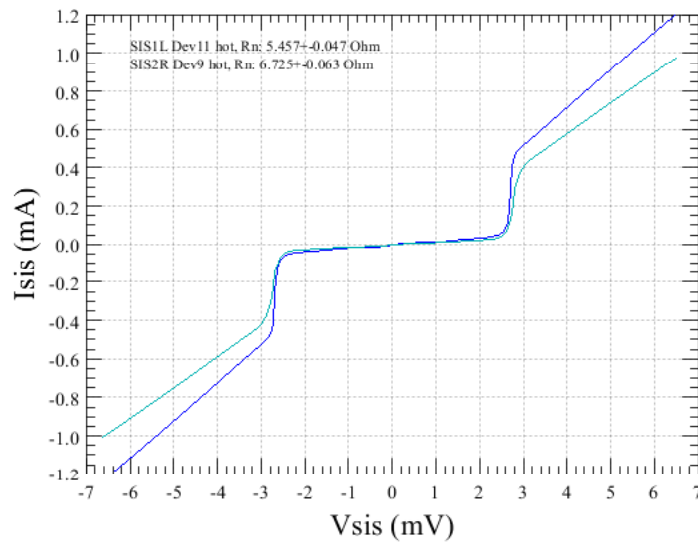
$$V_j = \hbar v / 2e \\ = 0.5 \text{ mV}$$

Magnet current

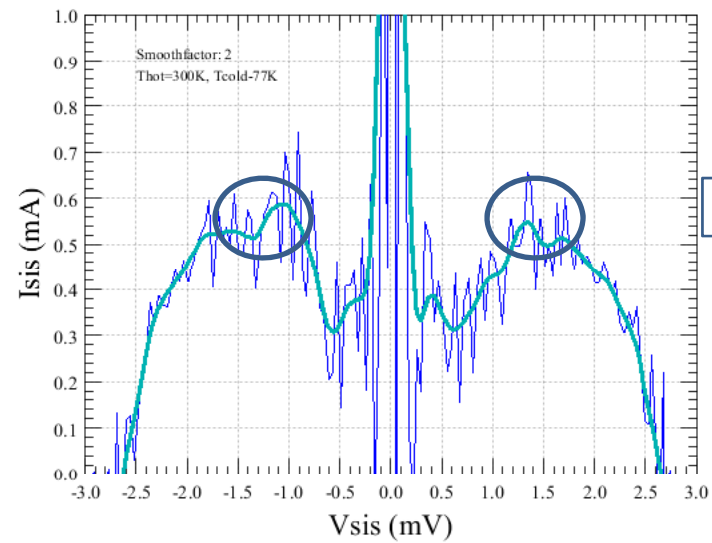


# 350 Balanced Mixer

Measured I/V

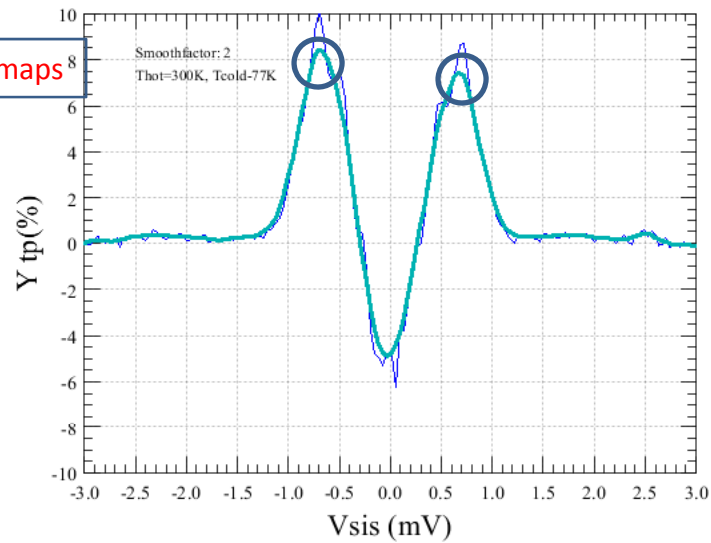


Y\_I<sub>sis</sub> (%)



0.5% for FTS

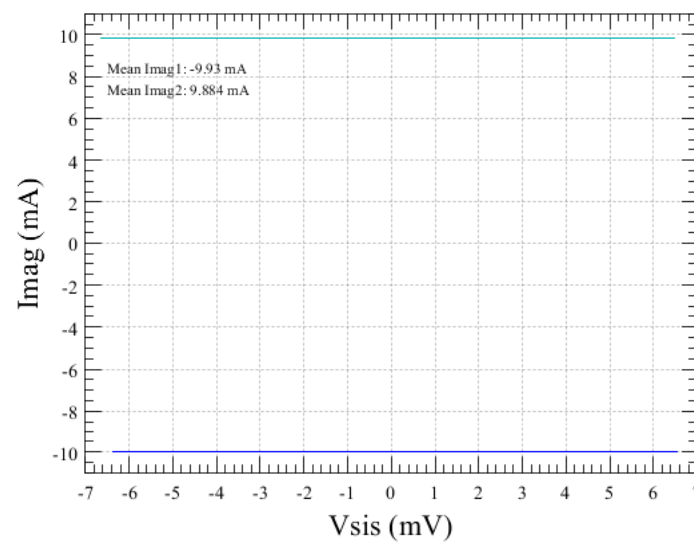
Y<sub>tp</sub> (%)



~8 % for beam maps

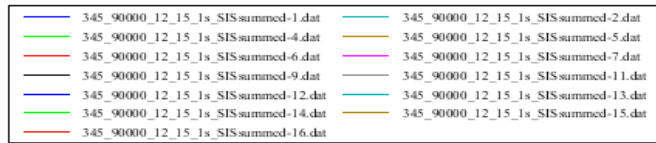
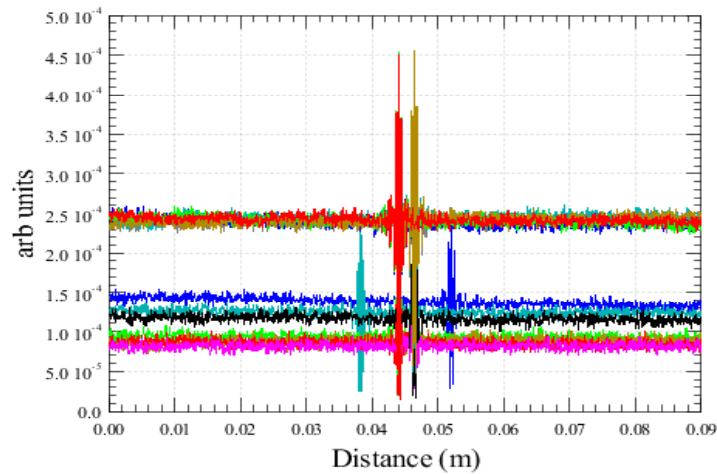
$$V_j = \frac{h\nu}{2e} = 0.75\text{mV}$$

Magnet Current

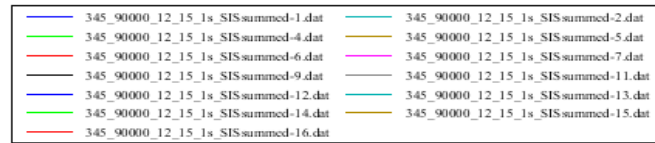
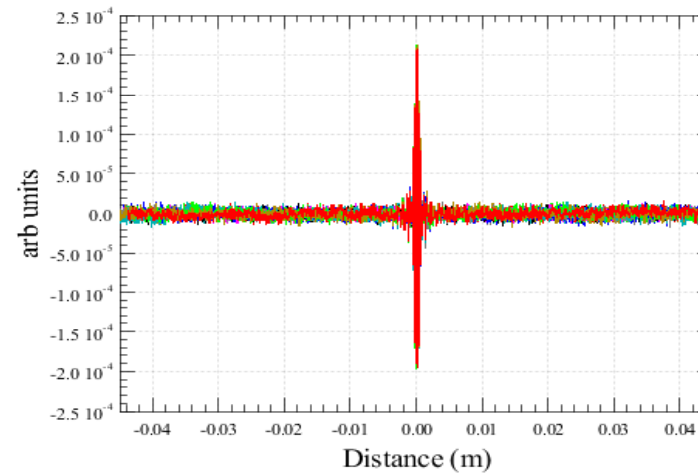


# 350 GHz Balanced Mixer FTS measurements

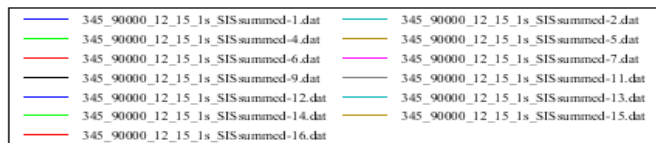
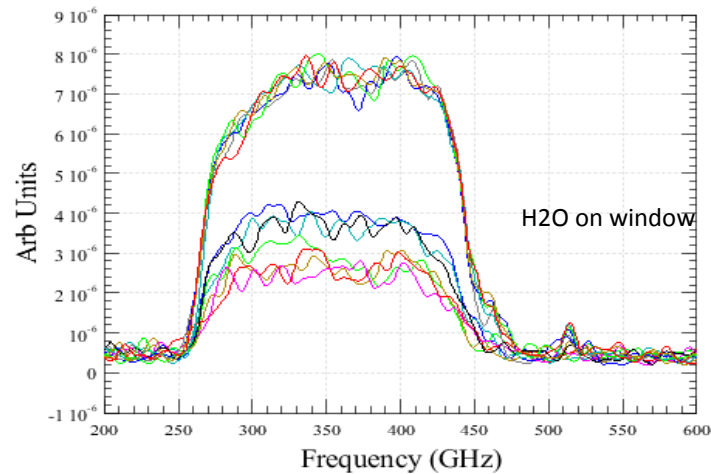
Uncorrected Inteferogram



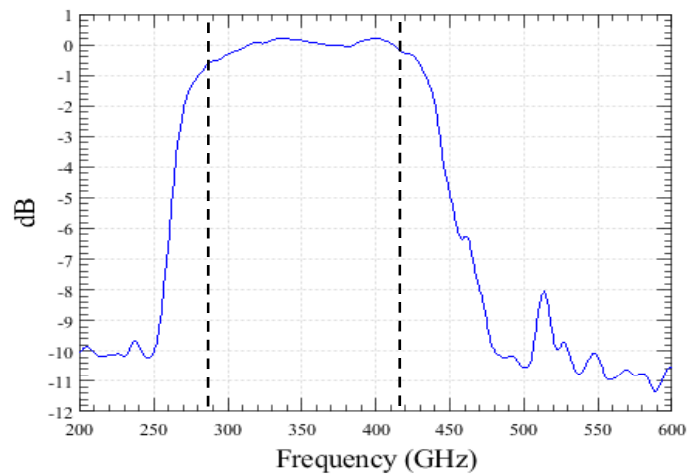
Corrected Inteferogram



Individual Spectra

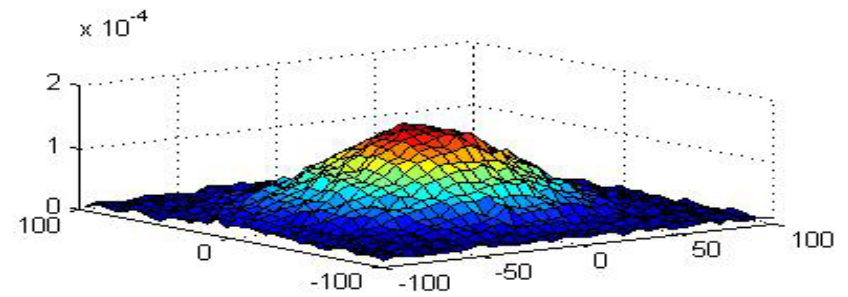
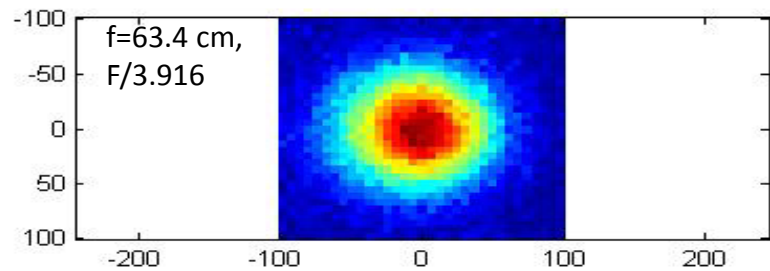
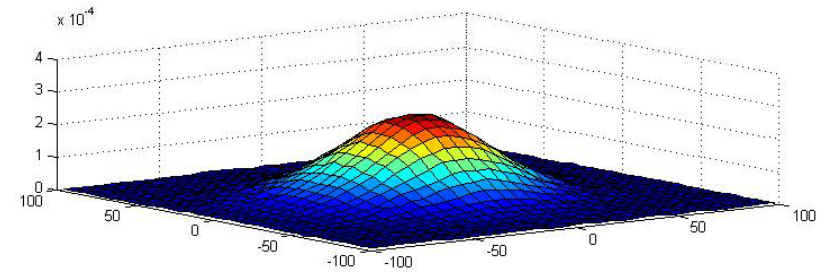
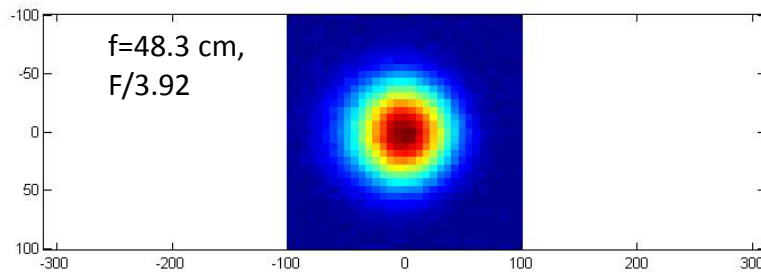
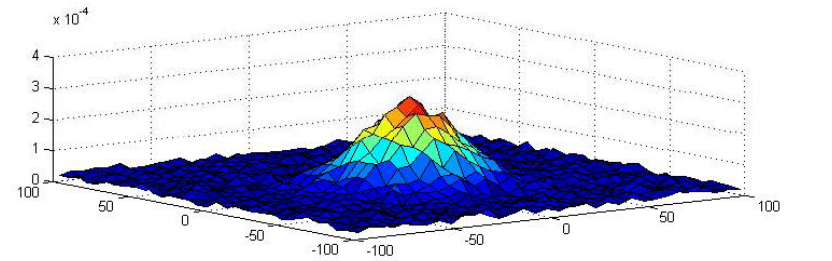
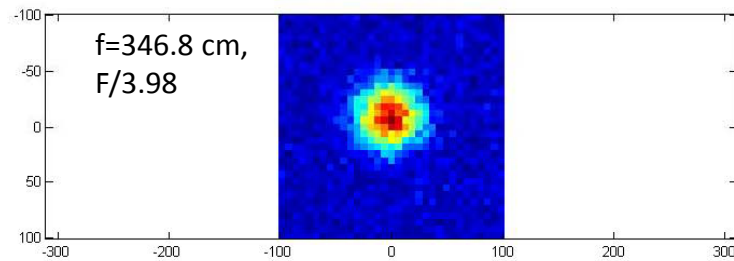
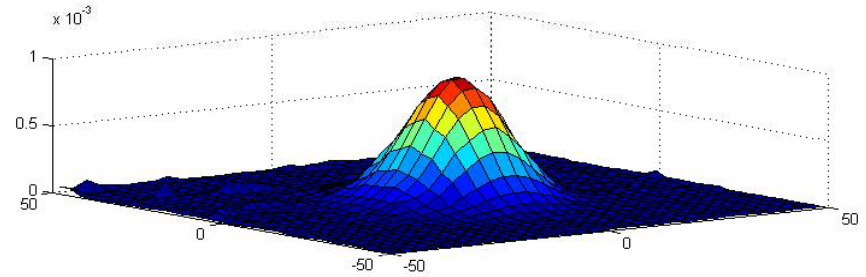
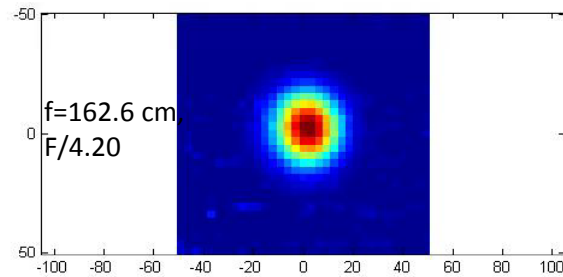


Normalized Averaged Spectra



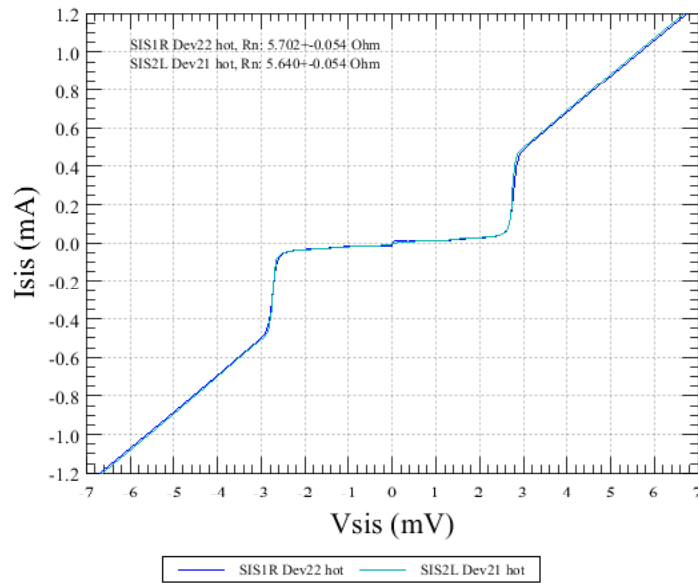
# 345 Mixer Beam Measurements (Direct detection mode) at 4 distances Cryostat

$$\langle f/D \rangle = 3.951 \pm 0.031 \text{ (Design: F3/3 – F/4.0)}$$

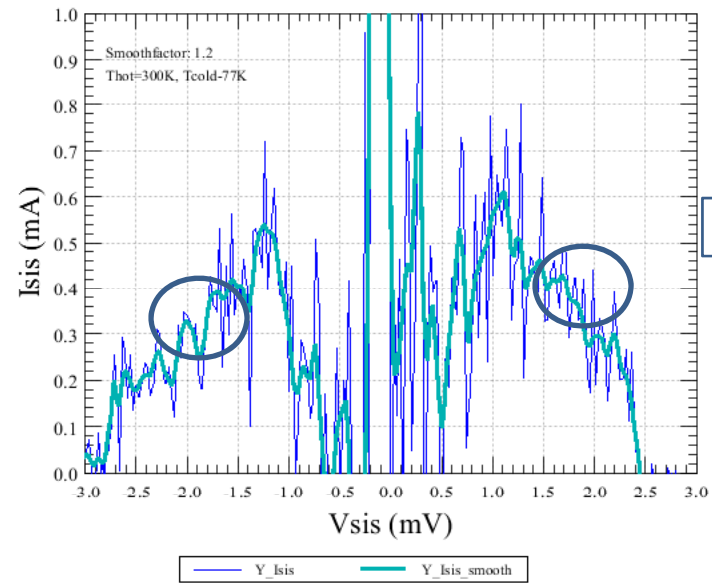


# 460 Balanced Mixer (Bfield Setting not quite Optimized)

Measured I/V, T=4.51K

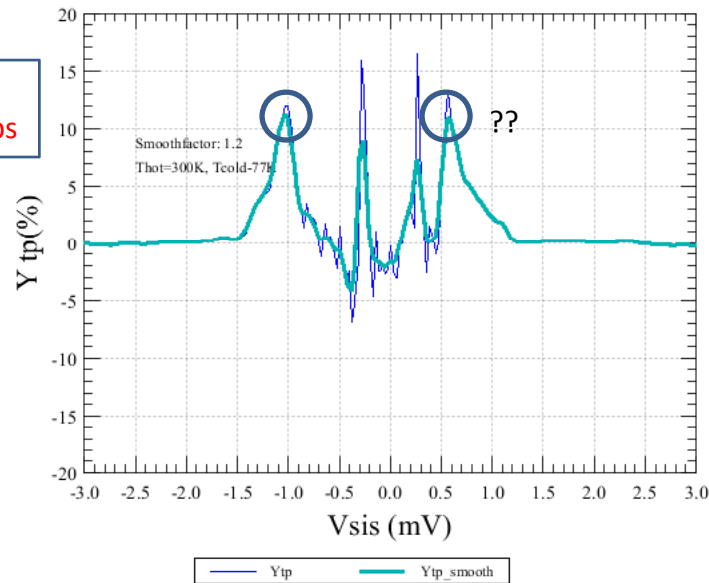


Y\_Isis (%)

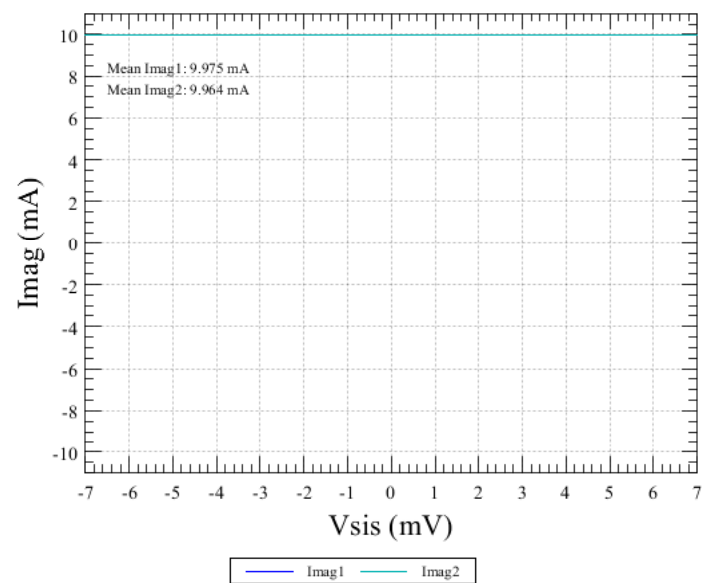


0.35 % for FTS

Ytp (%)



Magnet current

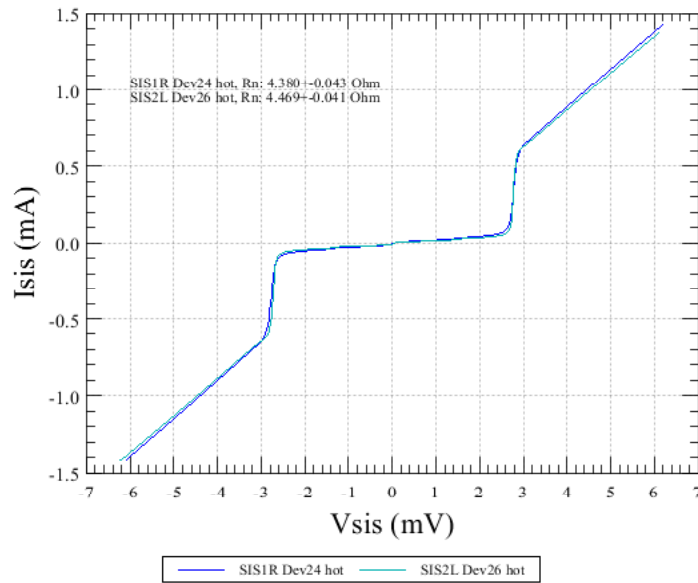


~10 %  
For beam maps

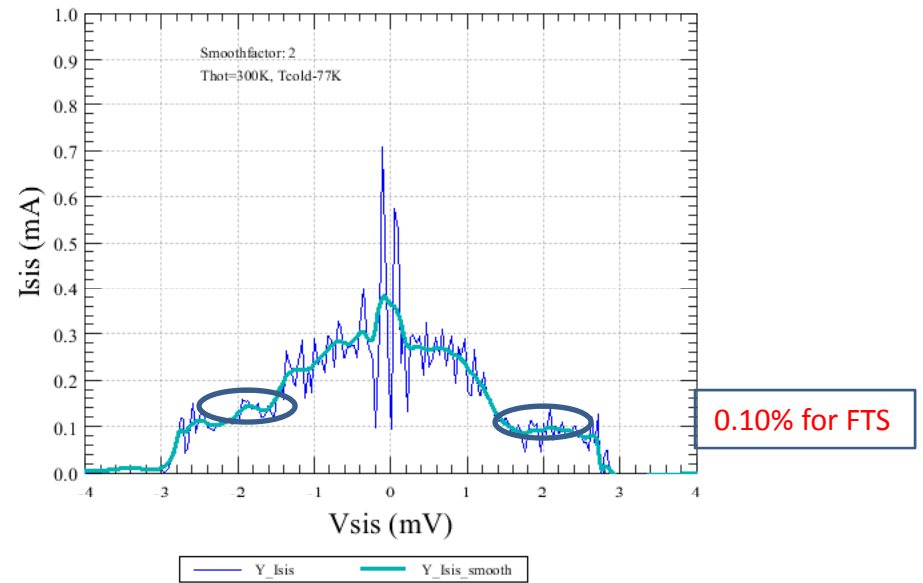
$$V_j = h\nu/2e = 0.97\text{mV}$$

# 650 Balanced Mixer

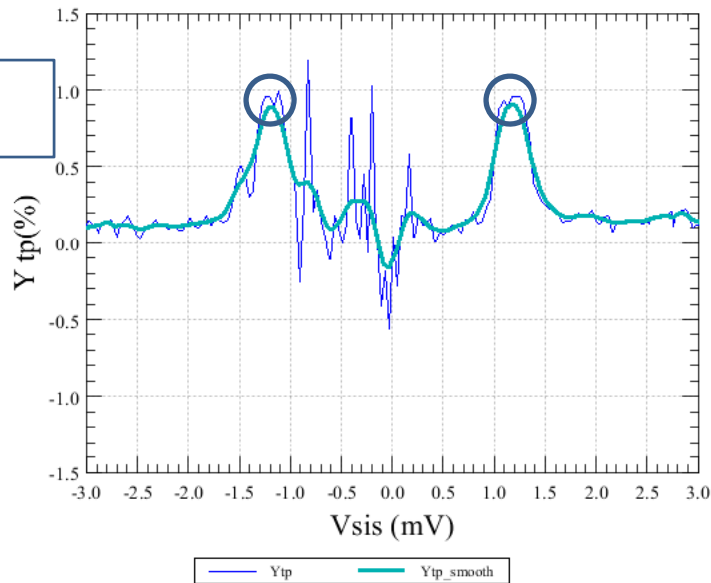
Measured I/V



Y\_Isis (%)



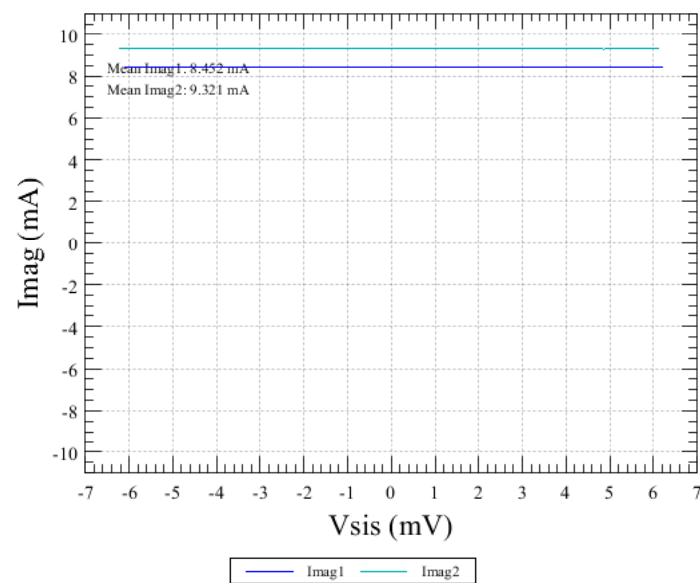
Y\_tp (%)



~8 % for beam maps

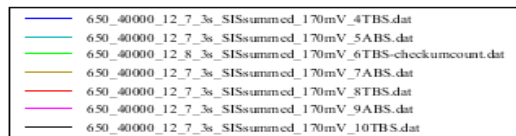
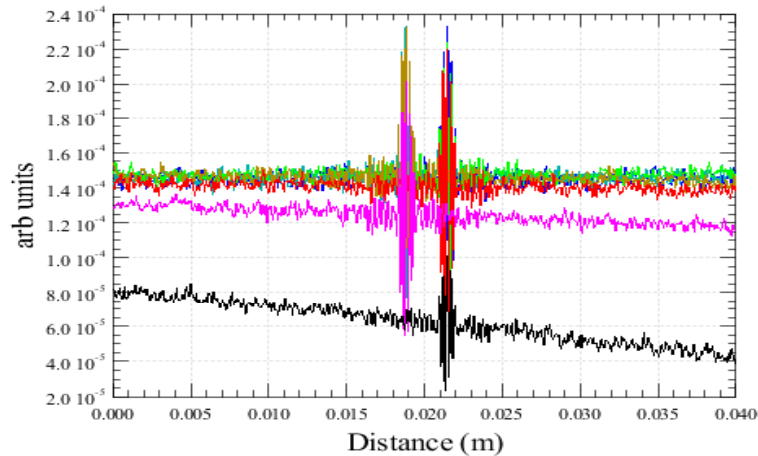
$$V_j = \hbar\nu/2e = 1.37 \text{ mV}$$

Magnet Current

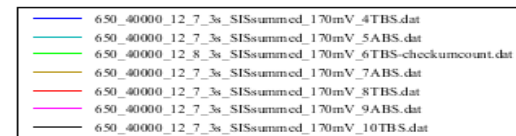
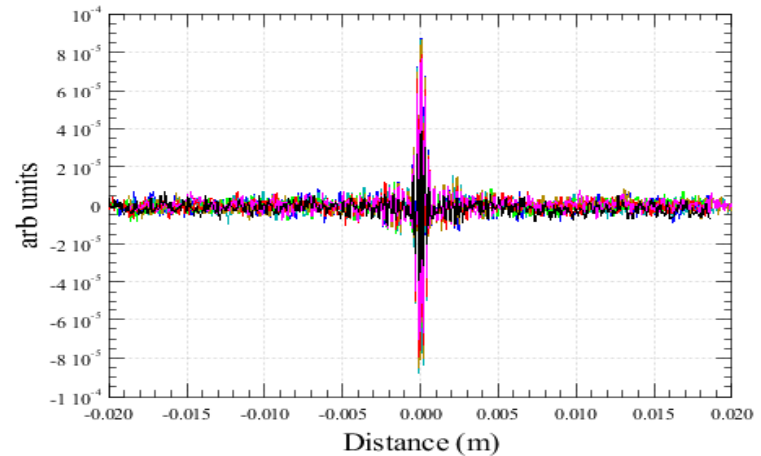


# 570-730 GHz Balanced Mixer FTS measurements

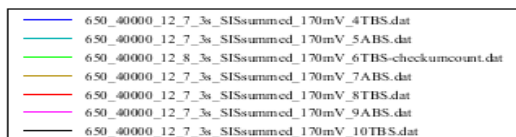
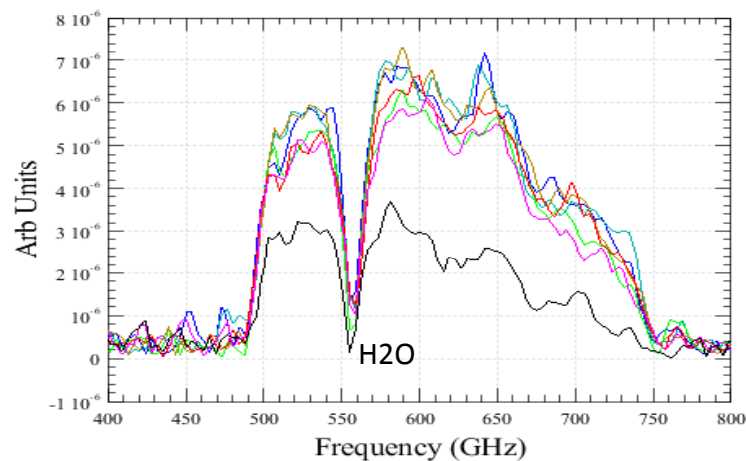
Uncorrected Inteferogram



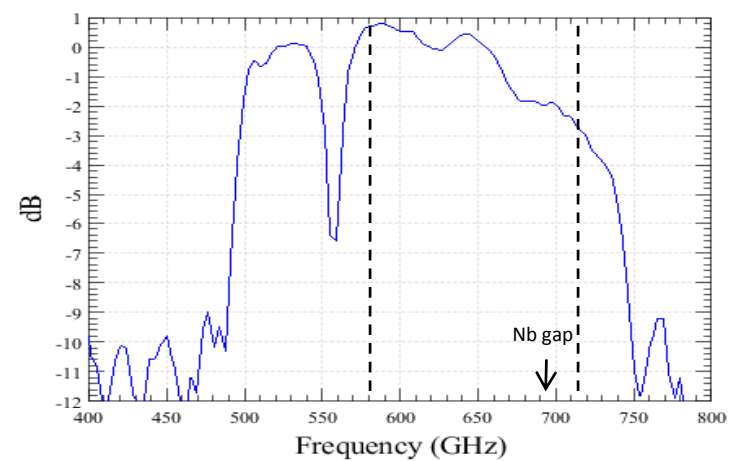
Corrected Inteferogram



Individual Spectra



Normalized Averaged Spectra





# 650 Mixer Beam Measurements (Direct detection mode) at 4 distances Cryostat

$$\langle f/D \rangle = 5.41 \pm 0.159 \text{ (Design: } F/4.7 - F/5.0 \text{)}$$

