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To: Millimeter-wave VLBI Group
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Subject: Phase corrections from phase cal amplitudes

During the recent 3mm VLBI experiment of Don Backer, et al, on the galactic center, we encountered some bad weather and, consequently, relatively poor coherence. For this experiment I show a sample scan for which I have plotted the system temperature (tsys) variations derived from the phase cal amplitude variations and, for Kitt Peak, the actual tsys variations from the continuum data file (0111.raw). I have also plotted the 3mm phase to see if there is a significant correlation. If the path length and tsys fluctuations are from water vapor alone one might expect perfect correlation with regression coefficient of about 0.5 mm/K. In fact the correlation is poor and the path length changes are much less than expected from the tsys changes. The explanation is that at 86 GHz the clouds (and it was a cloudy day) have a strong influence on tsys with a very small effect on the path length. However, Figure 1 clearly shows that tsys variations can be obtained from the phase cal. The technique might work well during clear summer days when presumably most of the path length changes are due to uncondensed water vapor.

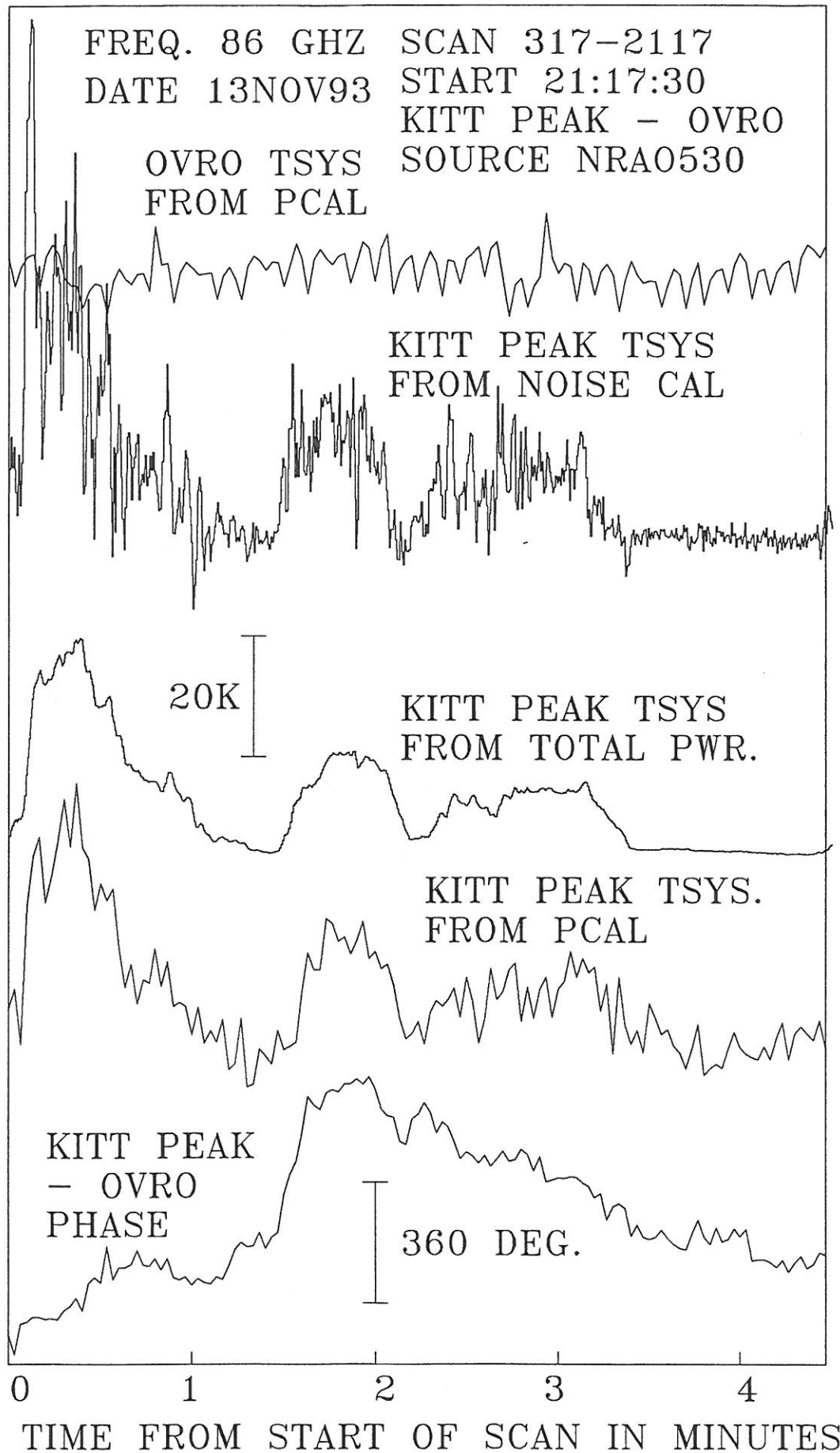


Figure 1.