

Cross-Pol Measurements of Cartridge B6-003 with OMT6-11 Replaced by OMT6-13, (Partial Results)

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This report shows partial but encouraging results for Band 6 Cartridge 003 cross-pol isolation. When the original OMT6-011, which had marginal polarization isolation ([Figure 11](#) and [Figure 13](#)) was replaced with the recently-built OMT6-013 exhibiting much better polarization isolation ([Figure 10](#) and [Figure 12](#)), the cross-pol isolation of the cartridge improved and now meets specifications as plotted in [Figure 1](#).

[Figure 2](#) through [Figure 9](#) compare cartridge cross-pol beam patterns when OMT6-013 and OMT6-011 is installed in the cartridge.

The remainder of the points for Pol 1 and all the points for Pol 0 will be measured over the weekend by Dave Schmitt.

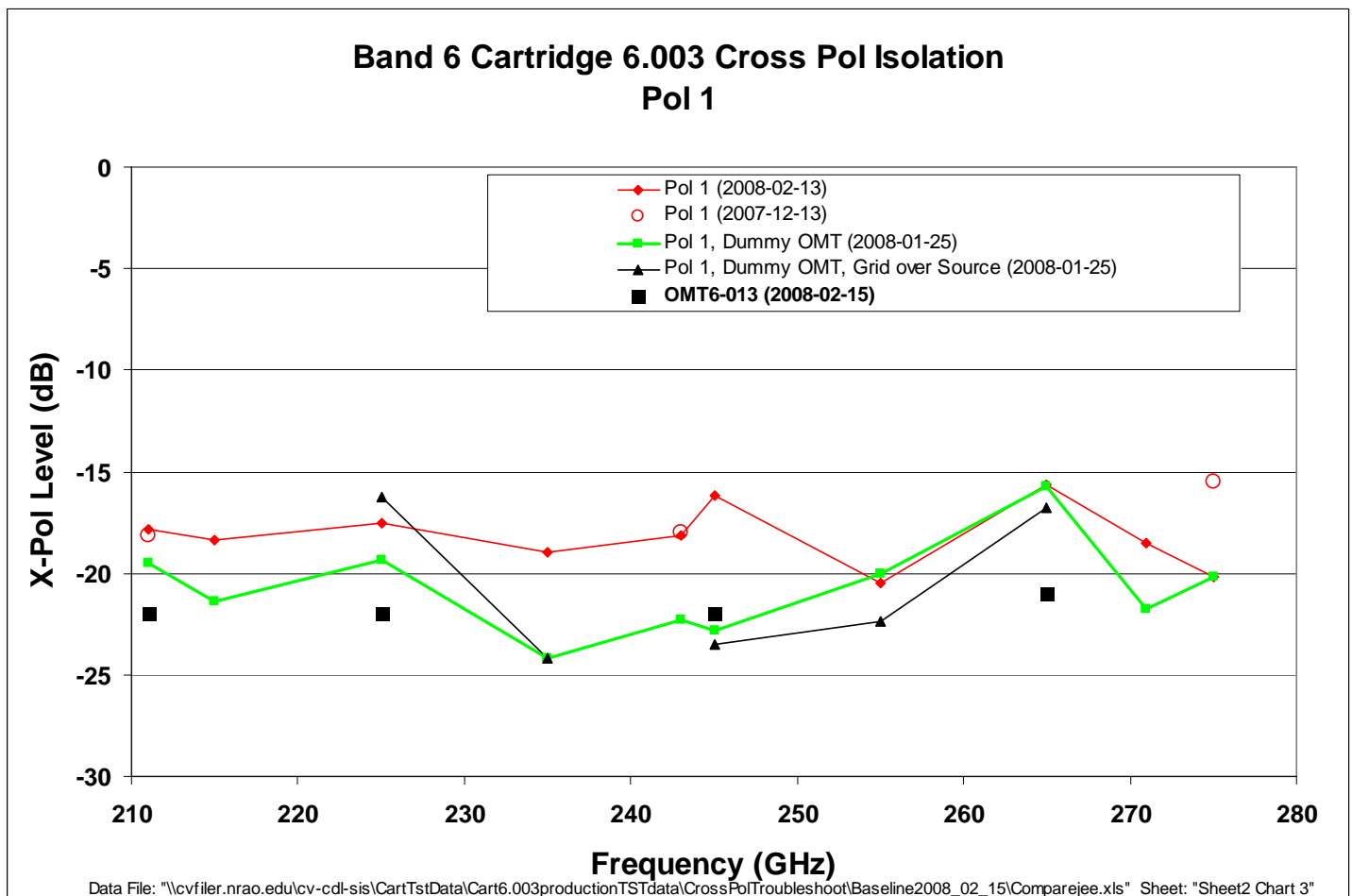


Figure 1: Cross-Pol Results, Cartridge B6-003 with OMT6-011 and -013

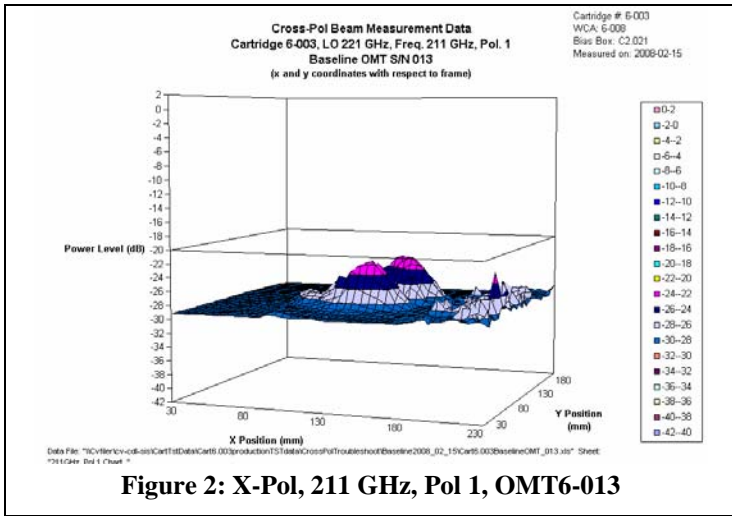


Figure 2: X-Pol, 211 GHz, Pol 1, OMT6-013

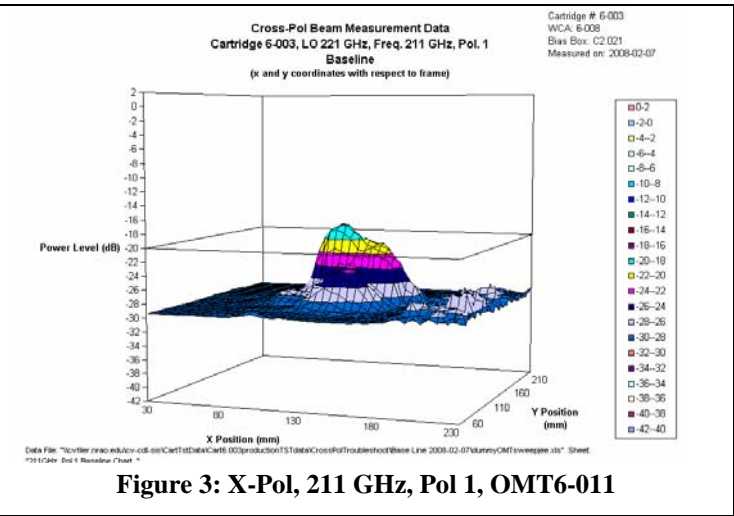


Figure 3: X-Pol, 211 GHz, Pol 1, OMT6-011

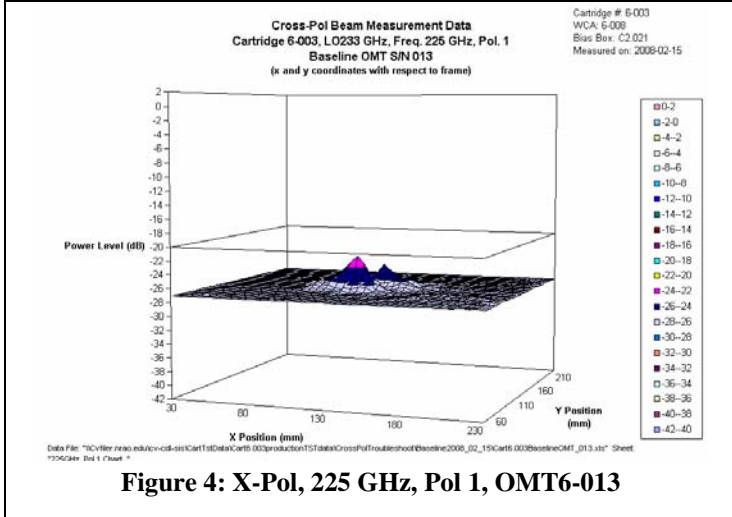


Figure 4: X-Pol, 225 GHz, Pol 1, OMT6-013

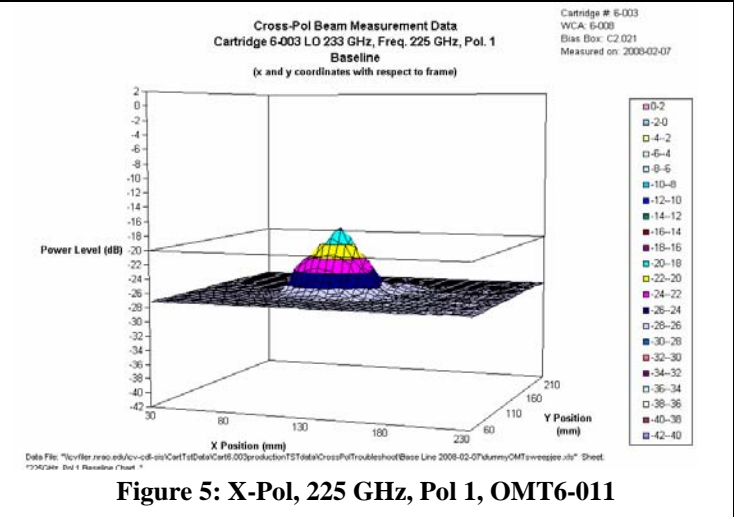


Figure 5: X-Pol, 225 GHz, Pol 1, OMT6-011

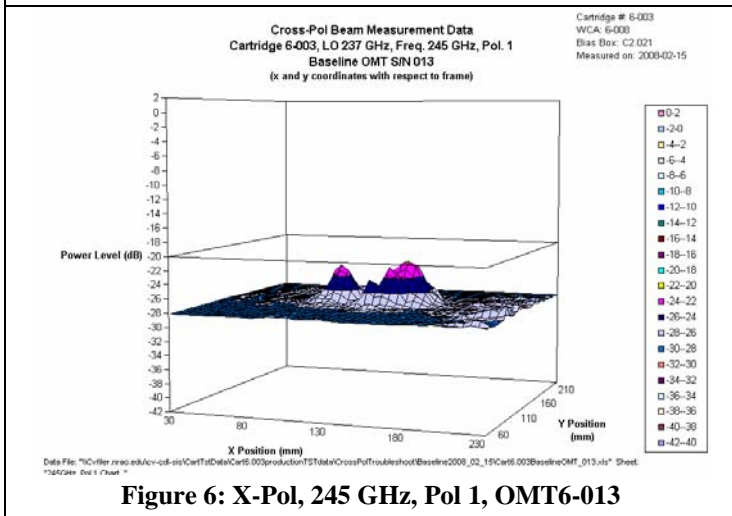


Figure 6: X-Pol, 245 GHz, Pol 1, OMT6-013

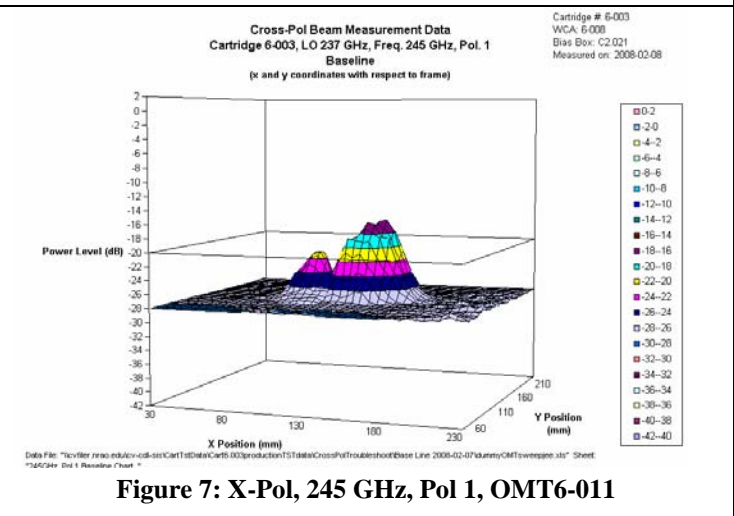


Figure 7: X-Pol, 245 GHz, Pol 1, OMT6-011

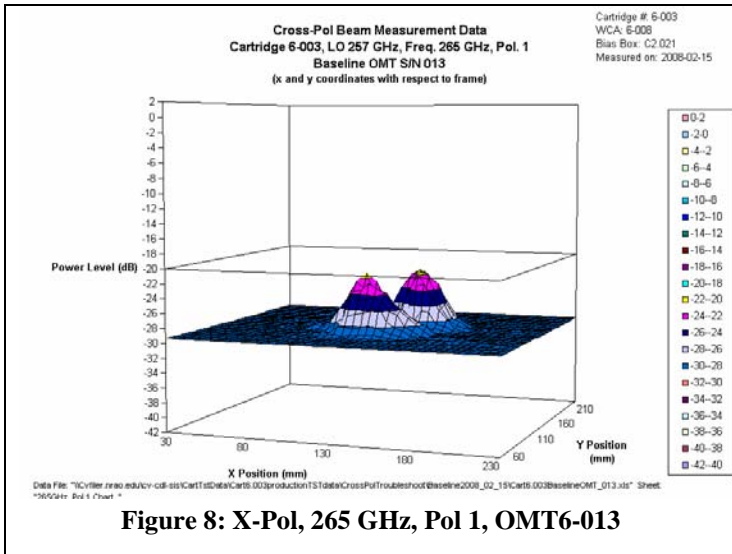


Figure 8: X-Pol, 265 GHz, Pol 1, OMT6-013

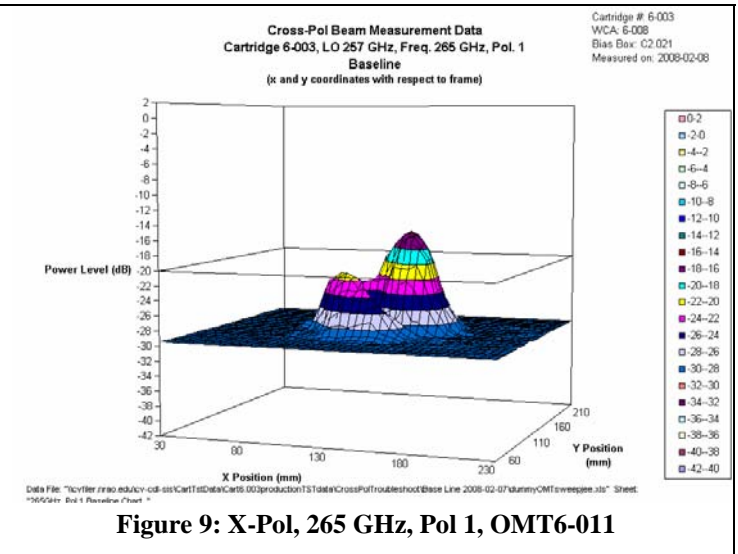


Figure 9: X-Pol, 265 GHz, Pol 1, OMT6-011

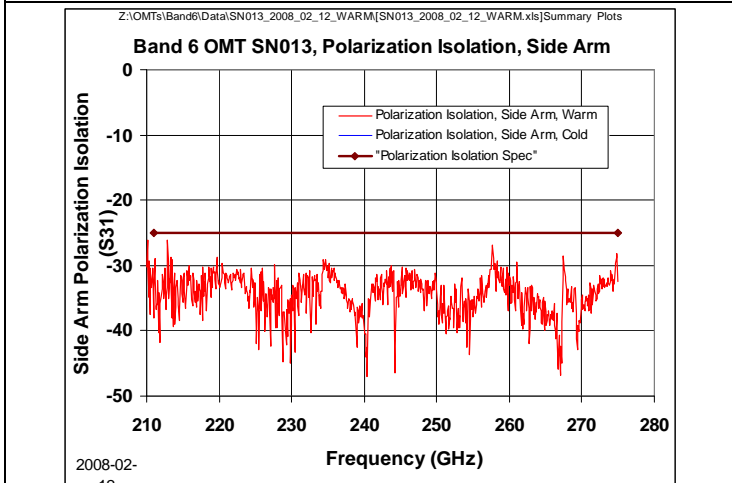


Figure 10: Pol Isolation from OMT6-013, Side Arm, Warm Data

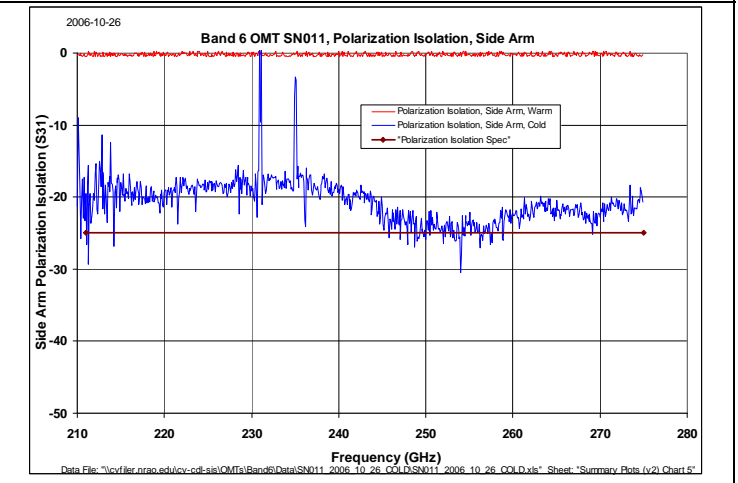


Figure 11: Pol Isolation from OMT6-011, Side Arm, Cold Data

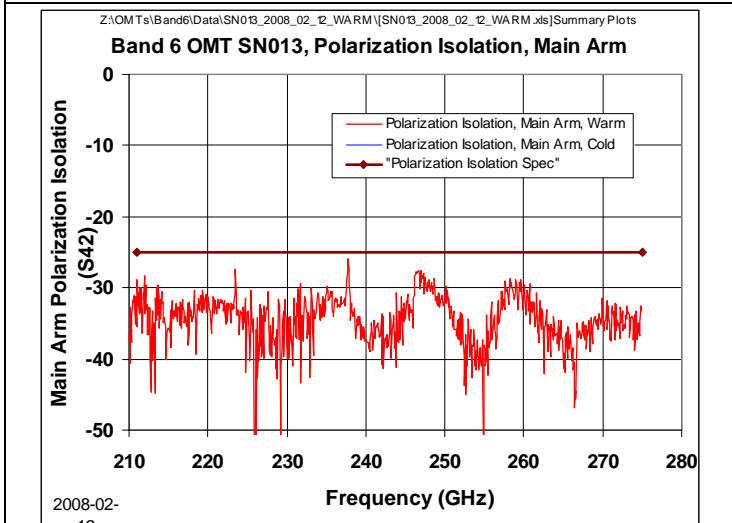


Figure 12: Pol Isolation from OMT6-013, Main Arm, Warm Data

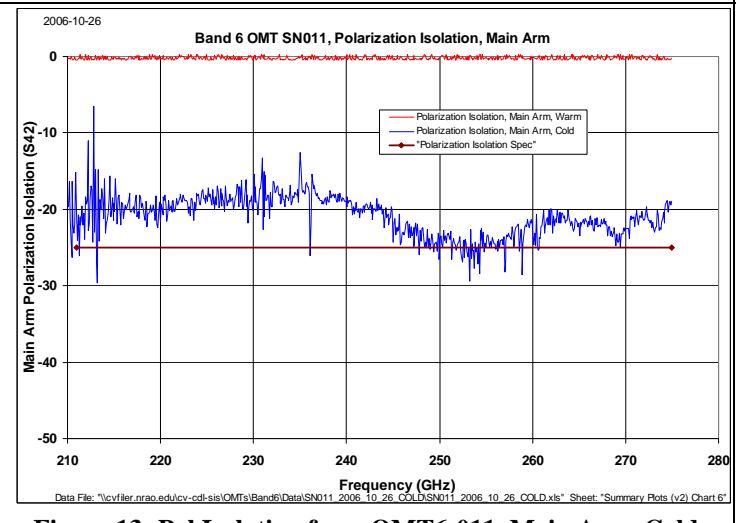


Figure 13: Pol Isolation from OMT6-011, Main Arm, Cold Data

Appendix I: Cross-Pol Measurements of Cartridge B6-003 compared to Dummy OMT, Pol 0 and 1

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Polarization isolation has now been measured for both polarizations of B6-003. [Figure 14](#) shows the isolation for Pol 0 and [Figure 15](#) is the isolation for Pol 1. Note the Pol 1 data was reported last week [here](#) and where it is shown that the results were carefully checked for compression and for accuracy using a spectrum analyzer.

Polarization 0 isolation ([Figure 14](#)), measured initially in Dec 2007 and repeated today, shows little difference when the real OMT is replaced with the dummy OMT. Also, the data measured in Dec differs at most 2 dB from the isolation measured today.

Polarization 1 isolation ([Figure 15](#)) shows a different story. There is good repeatability at 211 GHz and 245 GHz between the Dec data and today's, but a nearly 5 dB discrepancy exists at 275 GHz. As mentioned last week, cartridge cross-pol is significantly better with the dummy OMT than with the OMT installed in that cartridge, OMT6-011.

For reference, the measured polarization isolation for just the OMT is repeated in [Figure 16](#) and [Figure 17](#).

Despite a few frequencies showing large discrepancies between the most recent data and that measured in Dec, the trend is clear and we recommend replacing OMT6-011 with one of the latest batch, which are presently undergoing measurement and should be ready for installation tomorrow, 14 Feb 2008.

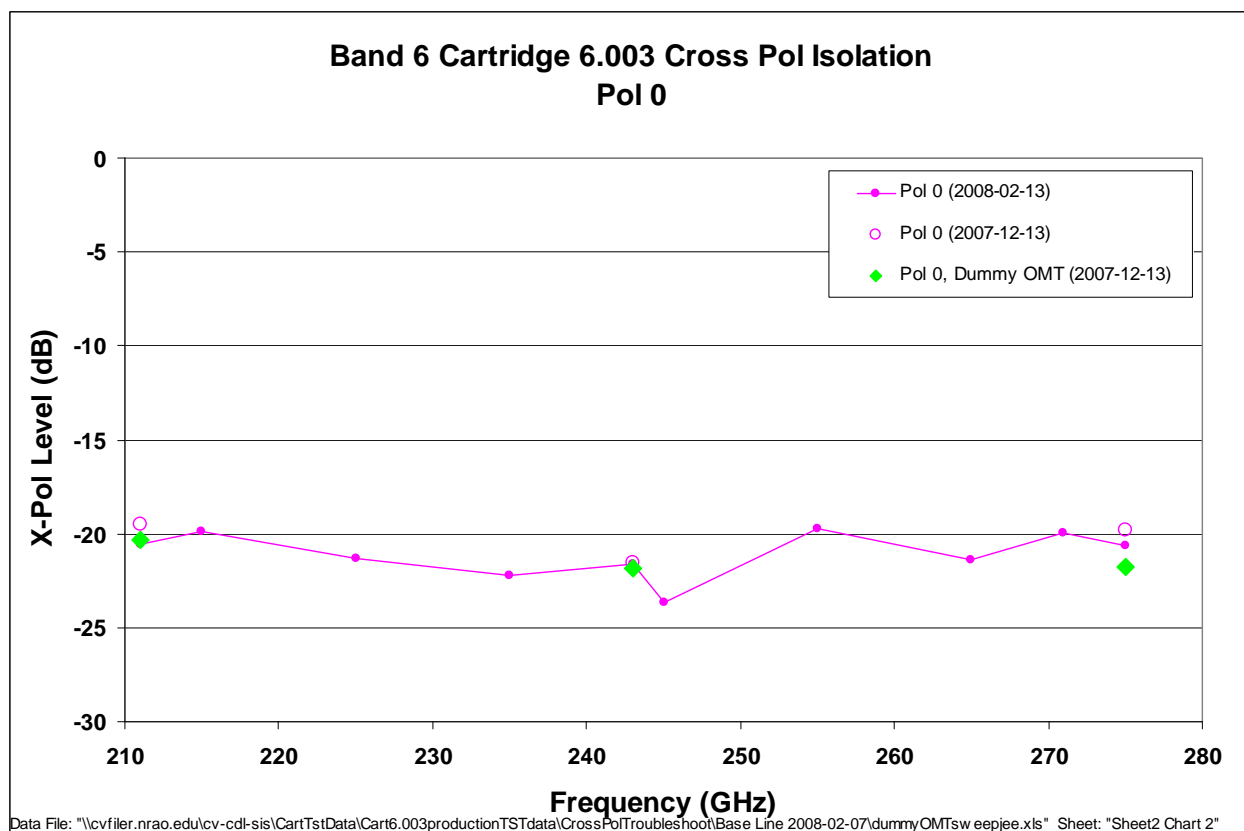


Figure 14: Polarization Isolation, Cartridge 6.003, Pol 0 ([Source](#))

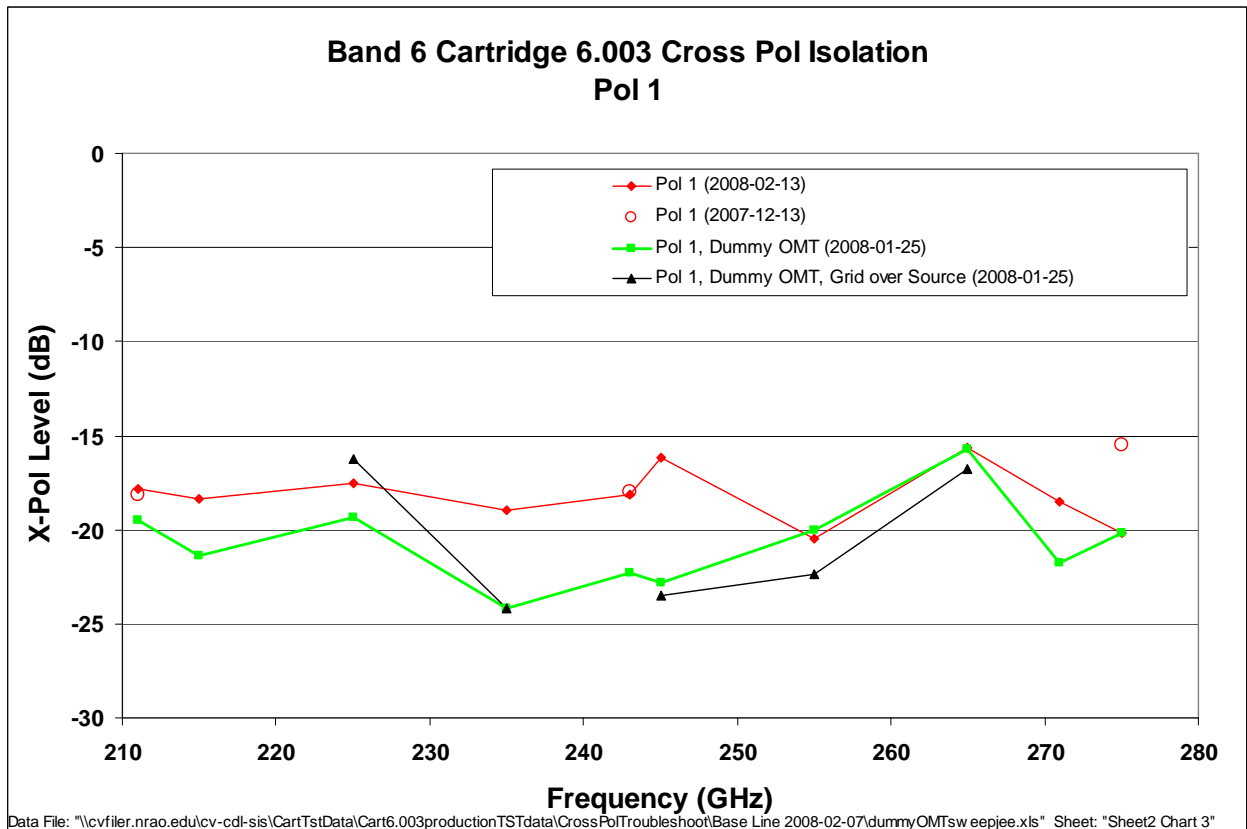


Figure 15: Polarization Isolation, Cartridge 6.003, Pol 1 ([Source](#))

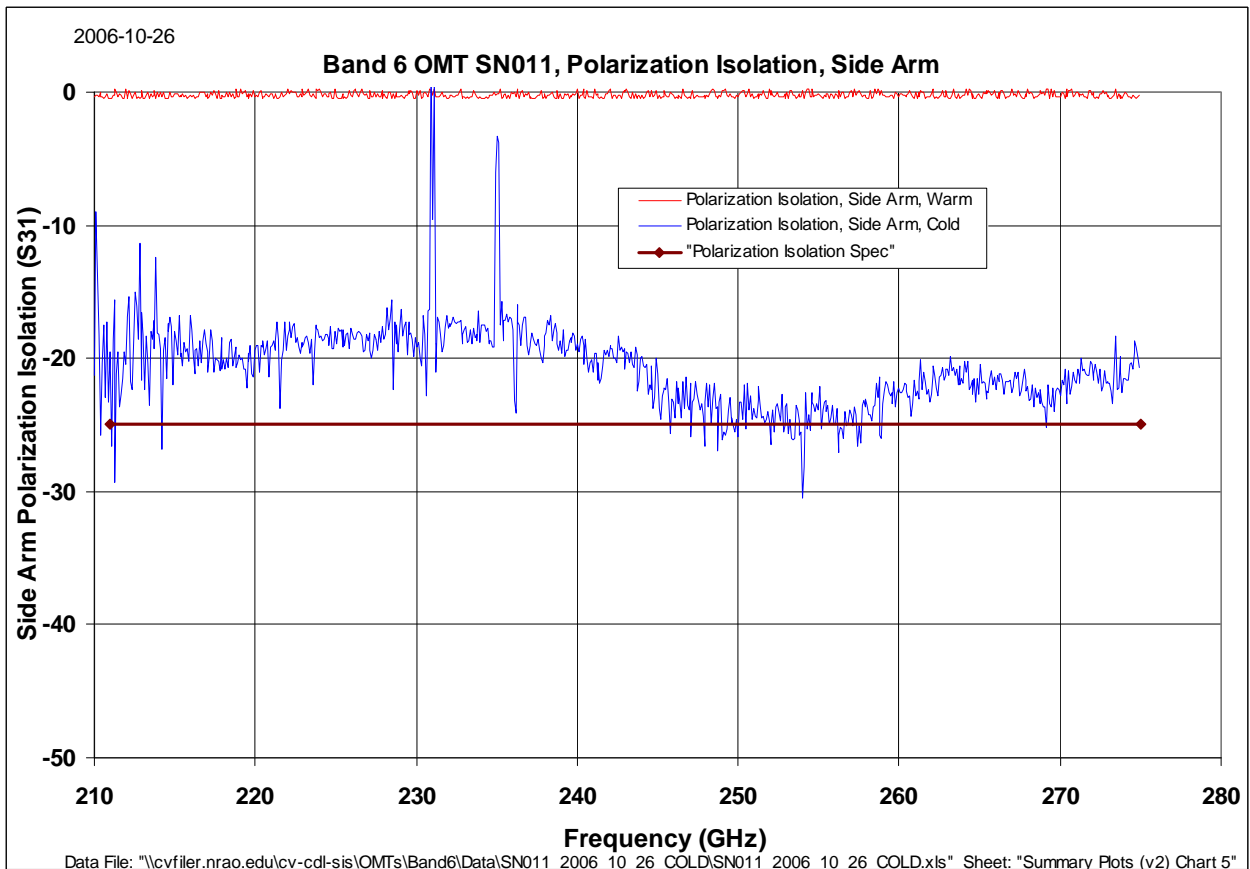


Figure 16: Polarization Isolation from OMT6-011, Side Arm

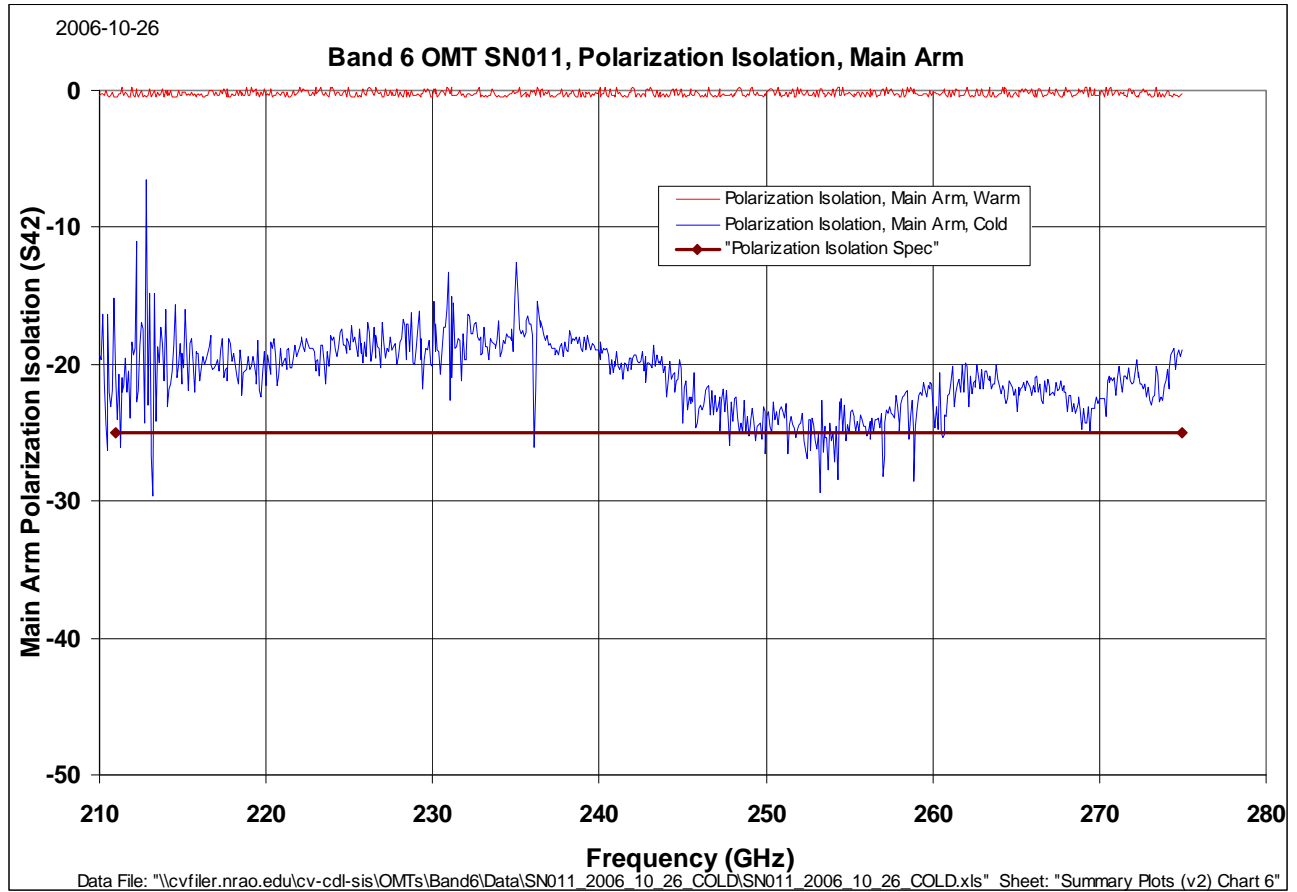


Figure 17: Polarization Isolation from OMT6-011, Main Arm