



... for a brighter future

Status of The Micro Pulse Lidar

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U.S. Department
of Energy



A U.S. Department of Energy laboratory
managed by The University of Chicago

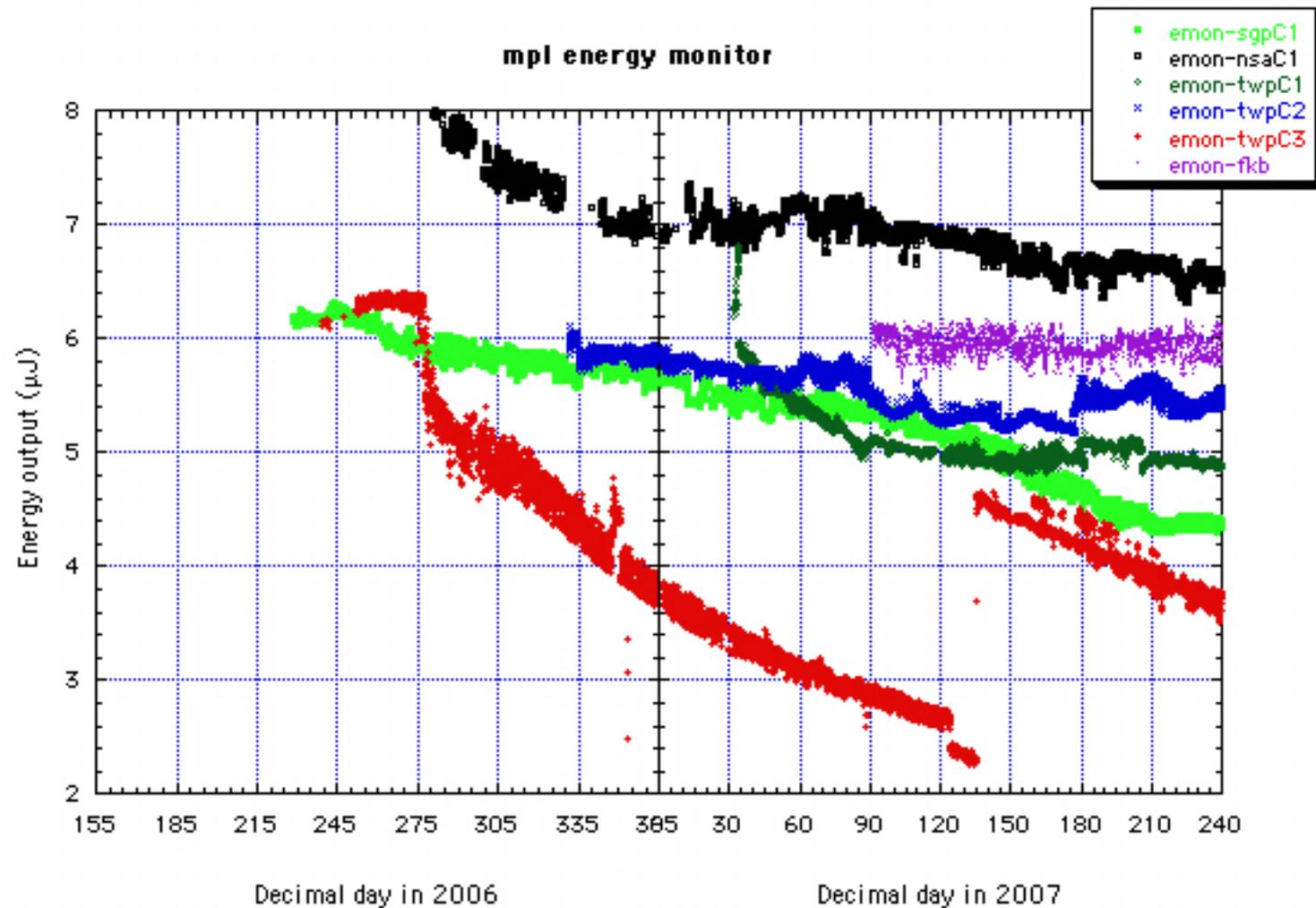
Disposition:

S/N	Location	Date Installed	Status
106	SGP-CF	08/01/2006	OK*
104	TWP-Darwin^	08/25/2006	Not Good
105	NSA-Barrow	09/28/2006	OK
108	TWP-Naaru	11/27/2006	OK
102	TWP-Manus	01/31/2007	OK
107	AMF-Germany	03/10/2007	OK**
101	TWP-Darwin	05/15/2007	OK**

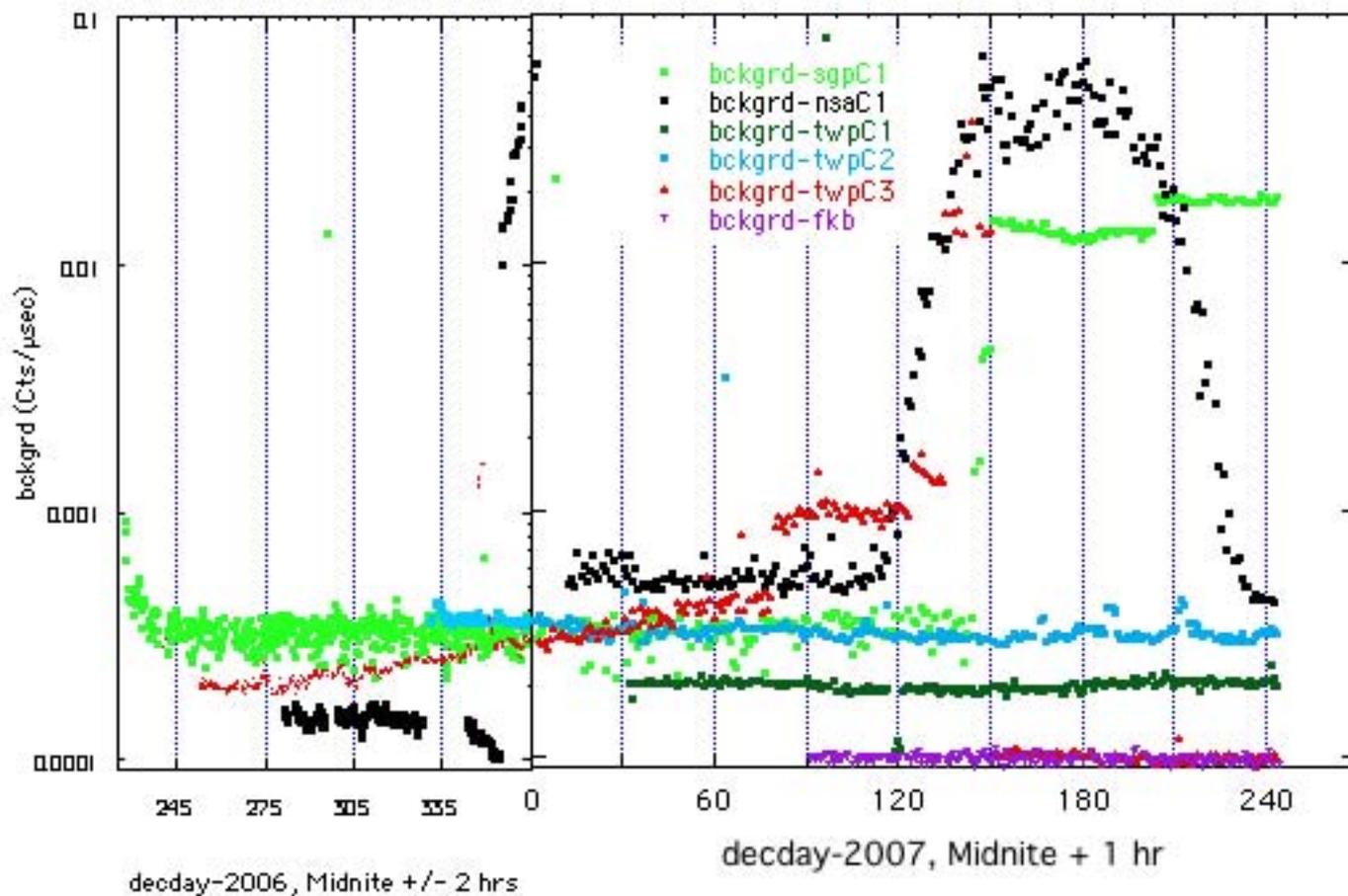
Problems:

- Reset of Polarization Control
- Automatic Restart after power failure
- Apparent Temperature Sensitivity
- Unrealistic data (continuous sequential layers, aliasing(?) e g.)
- Computer lock-up/crash (21 day period)

Exceeded 1-yr expectancy for Pump Diode



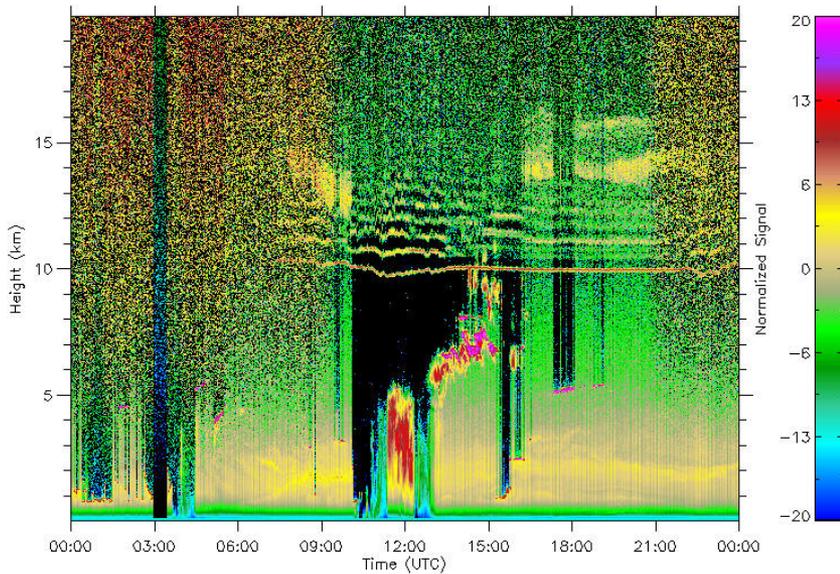
MPL Background



UNREALISTIC DATA: REPETITIVE LAYERS ALOFT

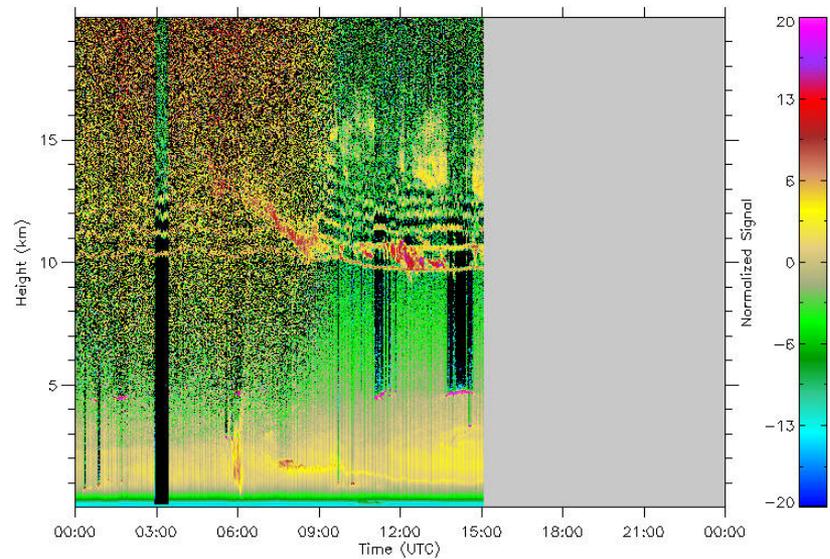
TWP C3 MicroPulse Polarized Lidar Observations, 13 December 2006

twpmplpolC3.b1
Co-Polarized Mode (mode 0)



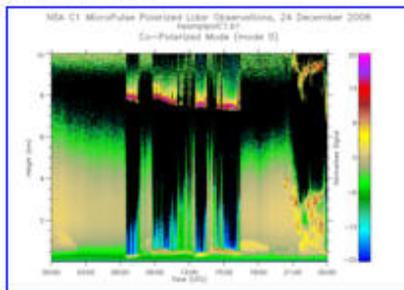
TWP C3 MicroPulse Polarized Lidar Observations, 14 December 2006

twpmplpolC3.b1
Co-Polarized Mode (mode 0)

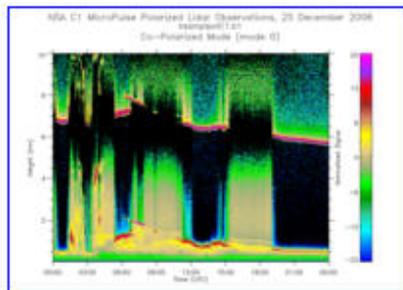


UNREALISTIC DATA: 'aliased' data, bad detector

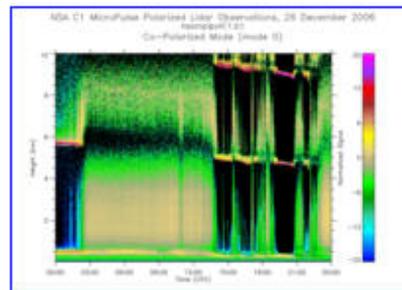
C1.mppol_coPol



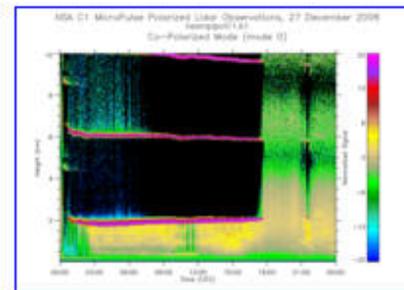
20061224



20061225

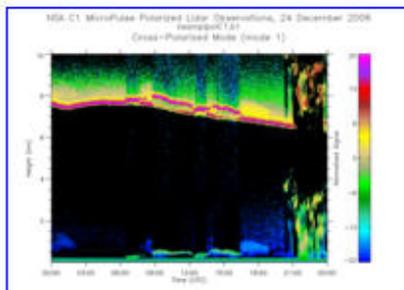


20061226

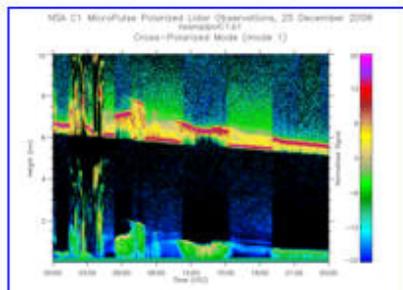


20061227

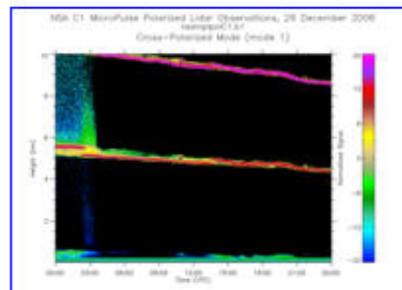
C1.mppol_crossPol



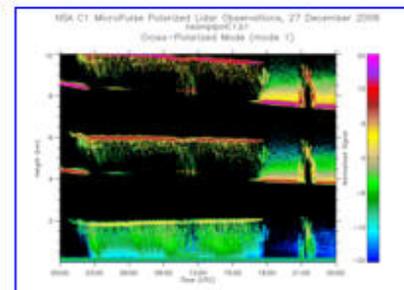
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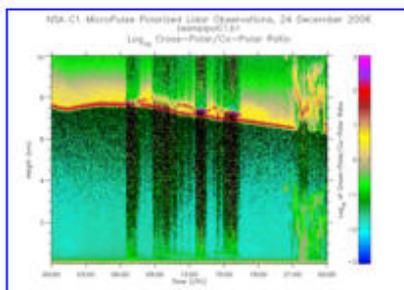


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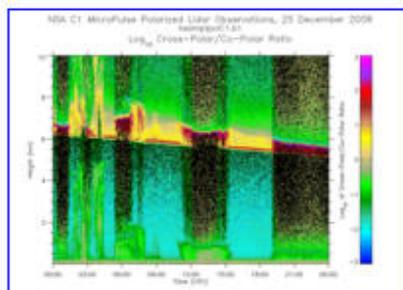


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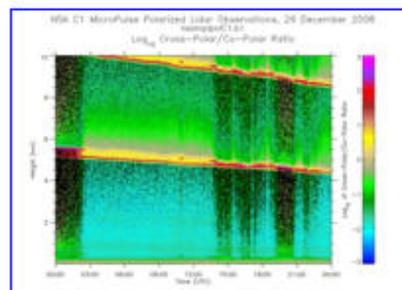
C1.mppol_polarRatio



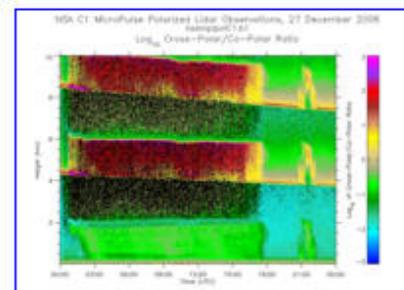
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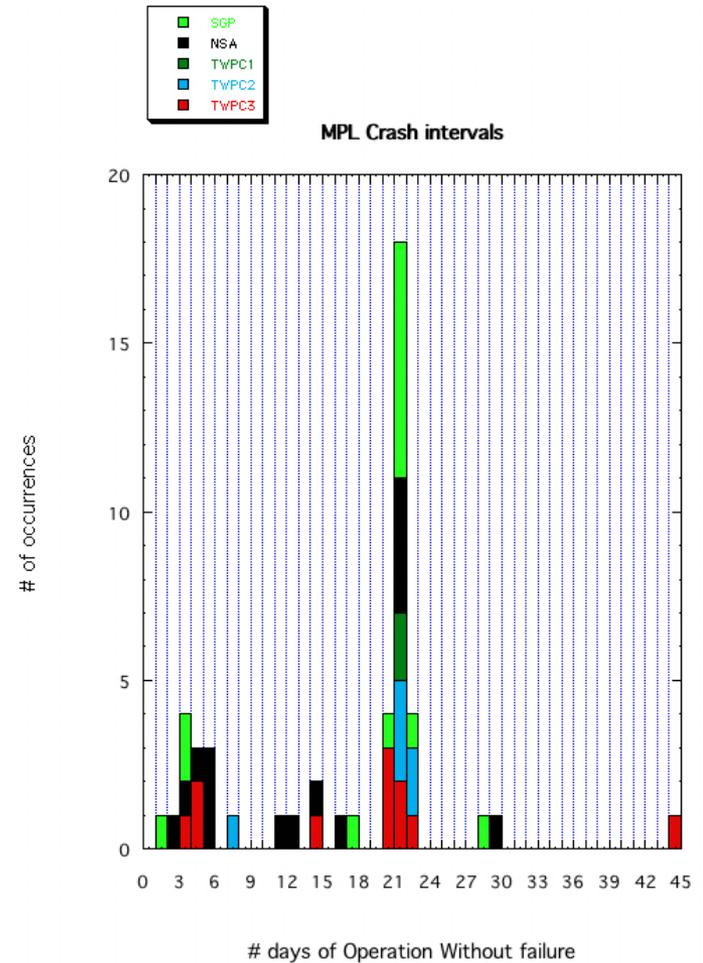
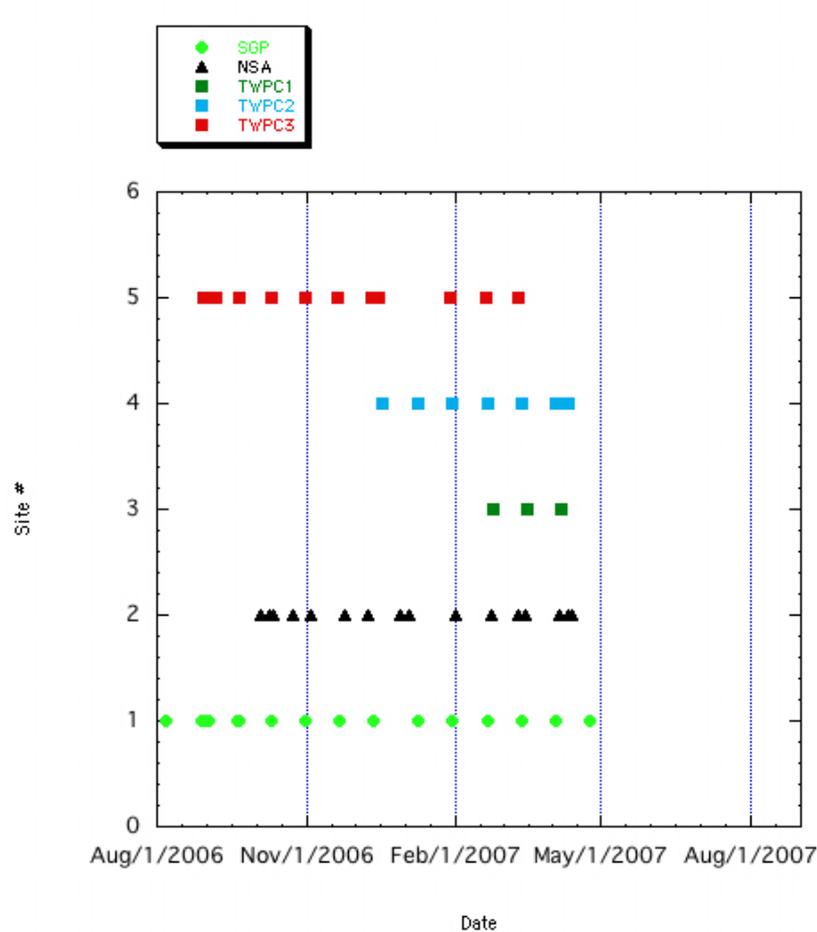


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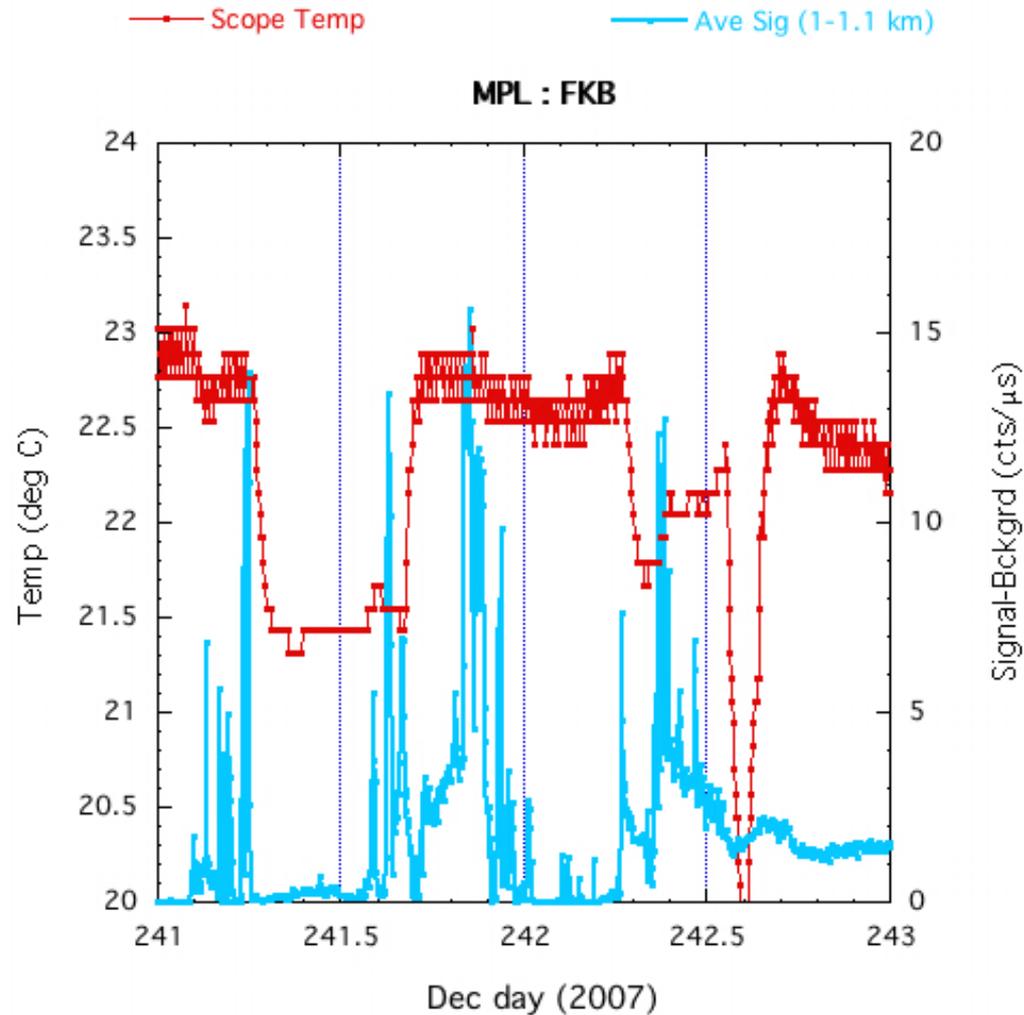


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21-day Period in System Crashes Remains a Mystery



Anti-condensation fan/heater raises Scope Temperature 1 - 2 Deg.



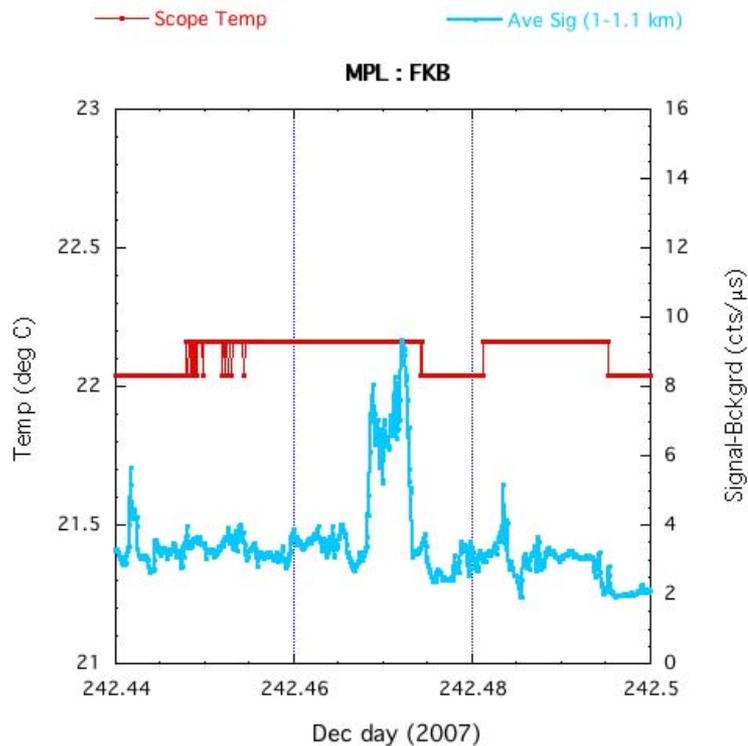
Example MPL Installation (FKB)

Fan exhausts into
housing above scope

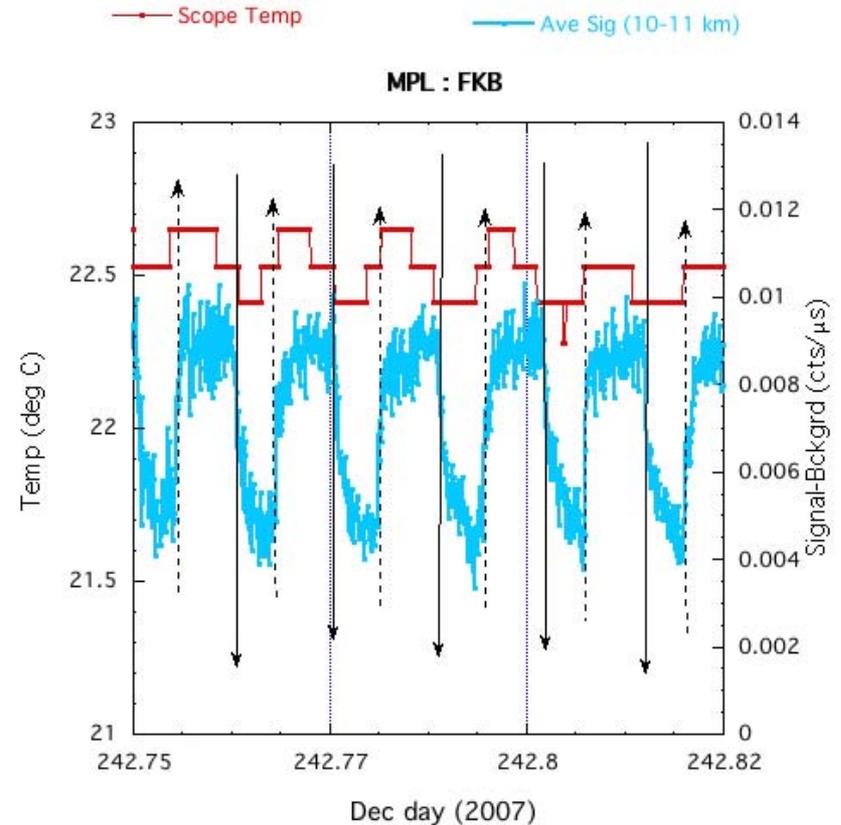


Anti-condensation fan Turbulence Causes Defocusing of Laser Beam

Fan off



Fan on



Current Efforts

- Work with Sigma Space to incorporate automatic restart in software - an ECO is in place for this
- Look at new methods for preventing condensation on window, including double pane (\$\$, energy loss) and heat tape (thermal gradients?)
- Work with Sigma Space to incorporate rapid switching between polarization states and simpler data handling strategy