MLS CLEAR-SKY PRODUCTION FORWARD MODEL:

Summary of Issues/Status/Actions in Regards to Spectroscopic and Instrument Calibration Data.

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ISSUES

- Tentative dates for definitive calibration data.
- Processing for THz filter shapes. Need to include the radiometer sideband frequency gradient in the filter data so as to be consistent with the definition below.

$$\Phi_{\mathrm{B,ch}}(\nu) \qquad r(\nu)\frac{\Phi_{\mathrm{FB,ch}}(\nu-\nu_{\mathrm{lo}})}{\int \Phi_{\mathrm{FB,ch}}(\Delta\nu)\,\mathrm{d}\Delta\nu}, \nu >$$

$$\Phi_{\mathrm{B,ch}}(\nu) \qquad r(\nu)\frac{\Phi_{\mathrm{FB,ch}}(\nu_{\mathrm{lo}}-\nu)}{\int \Phi_{\mathrm{FB,ch}}(\Delta\nu)\,\mathrm{d}\Delta\nu}, \nu <$$

$$r_{\mathrm{u,B,ch}} - \frac{\int_{\nu_{\mathrm{lo}}}^{\infty}\Phi_{\mathrm{B,ch}}(\nu)\,\mathrm{d}\nu}{\int_{-\infty}^{\infty}\Phi_{\mathrm{B,ch}}(\nu)\,\mathrm{d}\nu}$$

$$r_{\mathrm{l,B,ch}} = \frac{\int_{-\infty}^{\nu_{\mathrm{lo}}}\Phi_{\mathrm{B,ch}}(\nu)\,\mathrm{d}\nu}{\int_{-\infty}^{\infty}\Phi_{\mathrm{B,ch}}(\nu)\,\mathrm{d}\nu}$$

- Interface for adding insertion loss radiance baseline calculation in L2.
- Retrieving lo shift for THz?
- scan dependent ξ.
- Replace ν_j with ν in Boltzmann distribution function for computing absorption coefficients.

Goal is to have all these fixes and features in the version 1.2 software. They will be added toward the end of its development cycle.

CALIBRATION DATA

Table 1: Calibration Parameters

Parameter	Priority	Symbol	Responsible Person	Current Status	Launch ready
SPECTROSCOPY					
Catalogue List	1	$\mathcal{C}$	WGR	In progress	01-May-03
Molecule data					
Isotope fraction	1	$[f]$	WGR	L & S, WHF	Ready
Partition Function	1	$Q(T)$	WGR	JPL Catalogue	Ready
Mass	1	$\mathcal{M}$	WGR	WHF	Ready
Continuum	1	CONT_X	FCD	JRP	01-Apr-03
Line $\times$ line data					
Frequency	1	ν_0	WGR	JPL Catalogue	Ready
Lower state energy	1	E_ℓ	WGR	JPL Catalogue	Ready
Strength	1	$\mathcal{I}$	WGR	JPL Catalogue	Ready

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CALIBRATION DATA

Parameter	Priority	Symbol	Responsible Person	Current Status	Launch ready
^{81}BrO(625 GHz)	1				
Width		w_c, n_c	BJD	Measured	Ready
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	Measured	Ready
^{81}BrO(650 GHz)	1				
Width		w_c, n_c	BJD	Measured	Ready
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	Measured	Ready
CH_3CN(184 GHz)	2				
Width		w_c, n_c	BJD	Guess	01-Oct-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	Ignored	01-Oct-03
CH_3CN(202 GHz)	2				
Width		w_c, n_c	BJD	Guess	01-Oct-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	Ignored	01-Oct-03
CH_3CN(625 GHz)	2				
Width		w_c, n_c	BJD	Guess	01-Oct-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	Ignored	01-Oct-03

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CALIBRATION DATA

Parameter	Priority	Symbol	Responsible Person	Current Status	Launch ready
CH_3CN(660 GHz)	2				
Width		w_c, n_c	BJD	Guess	01-Oct-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	Ignored	01-Oct-03
CO(231 GHz)	2				
Width		w_c, n_c	BJD	Guess	01-Feb-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	Ignored	01-Feb-03
^{35}ClO(204 GHz)	1				
Width		w_c, n_c		JJO	Ready
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$		NA	Ready
^{35}ClO(650 GHz)	1				
Width		w_c, n_c		JJO	Ready
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$		NA	Ready
$H^{35}Cl$(626 GHz)	1				
Width		w_c, n_c	BJD	Measured	Ready
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	Measured	Ready

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CALIBRATION DATA

Parameter	Priority	Symbol	Responsible Person	Current Status	Launch ready
$H^{37}Cl$(625 GHz)	1				
Width		w_c, n_c	BJD	Measured	Ready
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	Measured	Ready
HCN(177 GHz)	2				
Width		w_c, n_c	BJD	Guess	01-Oct-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	Ignored	01-Oct-03
H_2O(183 GHz)	1				
Width		w_c, n_c		AB & TMG	Ready
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$		HCP	Ready
H_2O(2.532 THz)	1				
Width		w_c, n_c	BJD	HITRAN	01-Aug-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	Ignored	01-Aug-03
HNO_3(181 GHz)	1				
Width		w_c, n_c	BJD	Guess	15-Mar-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	Ignored	15-Mar-03

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CALIBRATION DATA

Parameter	Priority	Symbol	Responsible Person	Current Status	Launch ready
HNO_3(206 GHz)	1				
Width		w_c, n_c		TMG	Ready
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$		NA	Ready
HNO_3(626 GHz)	2				
Width		w_c, n_c	BJD	Guess	15-Mar-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	Ignored	15-Mar-03
HNO_3(633 GHz)	2				
Width		w_c, n_c	BJD	Guess	15-Mar-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	Ignored	15-Mar-03
HNO_3(651 GHz)	2				
Width		w_c, n_c	BJD	Guess	15-Mar-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	Ignored	15-Mar-03
HNO_3(660 GHz)	2				
Width		w_c, n_c	BJD	Guess	15-Mar-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	Ignored	15-Mar-03

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CALIBRATION DATA

Parameter	Priority	Symbol	Responsible Person	Current Status	Launch ready
$HO^{35}Cl$(636 GHz)	2				
Width		w_c, n_c	BJD	Guess	15-Mar-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	Ignored	15-Mar-03
$HO^{37}Cl$(2.515 THz)	2				
Width		w_c, n_c	BJD	Guess	01-Aug-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	Ignored	01-Aug-03
HO_2(625 GHz)	1				
Width		w_c, n_c	BJD	Measured, in progress	01-May-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	?	01-May-03
HO_2(650 GHz)	1				
Width		w_c, n_c	BJD	Measured, in progress	01-May-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	?	01-May-03
HO_2(660 GHz)	1				
Width		w_c, n_c	BJD	Measured, in progress	01-May-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	?	01-May-03

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CALIBRATION DATA

Parameter	Priority	Symbol	Responsible Person	Current Status	Launch ready
N_2O(201 GHz)	1				
Width		w_c, n_c	WGR	AH, but needs updating	15-Jan-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$		NA	Ready
N_2O(653 GHz)	1				
Width		w_c, n_c	WGR	AH, but needs updating	15-Jan-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$		NA	Ready
OH(2.510 THz)	1				
Width		w_c, n_c	BJD	KP	01-Apr-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	Ignored	01-Apr-03
OH(2.514 THz)	1				
Width		w_c, n_c	BJD	KP	01-Apr-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	Ignored	01-Apr-03

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CALIBRATION DATA

Parameter	Priority	Symbol	Responsible Person	Current Status	Launch ready
O_2(118 GHz)	1				
Width		w_c, n_c		HMP	Ready
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$		AFK	Ready
O_2(2.502 THz)	1				
Width		w_c, n_c	BJD	KP	01-Jun-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	Ignored	01-Jun-03
$O^{18}O$(234 GHz)	1				
Width		w_c, n_c	BJD	Guess	15-Jan-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	Ignored	15-Jan-03
O_3(184 GHz)	2				
Width		w_c, n_c		JJO	Ready
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$		NA	Ready
O_3(206 GHz)	1				
Width		w_c, n_c		JJO	Ready
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$		NA	Ready

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CALIBRATION DATA

Parameter	Priority	Symbol	Responsible Person	Current Status	Launch ready
O_3(240 GHz)	1				
Width		w_c, n_c	BJD	Measured	Ready
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	Measured	Ready
O_3(625 GHz)	1				
Width		w_c, n_c	BJD	Measured	Ready
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	Measured	Ready
O_3(2.509 THz)	1				
Width		w_c, n_c	BJD	HITRAN	01-May-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	ignored	01-May-03
O_3(2.543 THz)	1				
Width		w_c, n_c	BJD	HITRAN	01-May-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	ignored	01-May-03
SO_2(200 GHz)	3				
Width		w_c, n_c	BJD	Guess	01-Oct-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	ignored	01-Oct-03

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CALIBRATION DATA

Parameter	Priority	Symbol	Responsible Person	Current Status	Launch ready
SO_2(204 GHz)	3				
Width		w_c, n_c		CB	Ready
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$		NA	Ready
SO_2(660 GHz)	3				
Width		w_c, n_c	BJD	Guess	01-Oct-03
Shift		$\Delta\nu_0$, $n_{\Delta\nu_0}$	BJD	ignored	01-Oct-03

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CALIBRATION DATA

Parameter	Priority	Symbol	Responsible Person	Current Status	Launch ready
INSTRUMENT					
Filters GHz & THz (FB, MB, WB)					
Frequency	1	$\nu_{\mathrm{sb,B,ch}}$	RFJ		Ready
Shapes	1	$\Phi_{\mathrm{sb,B,ch}}(\nu)$	RFJ	Replicated FB 25	
R1A, R1B	1	$\Phi_{\mathrm{l,1,21,32,34},ch}(\nu)$	RFJ		01-Mar-03
R2	1	$\Phi_{\mathrm{sb,2--6,27},ch}(\nu)$	RFJ		15-Mar-03
R3	1	$\Phi_{\mathrm{sb,7--9},ch}(\nu)$	RFJ		01-Apr-03
R4	1	$\Phi_{\mathrm{sb,10--14,28--31},ch}(\nu)$	RFJ		15-Apr-03
R5	1	$\Phi_{\mathrm{sb,15--20},ch}(\nu)$	RFJ		01-May-03
(DACS)					
Frequency	1	$\nu_{\mathrm{sb,ch}}$	MJS		Ready
Pre-filter Shapes	1	$\Phi_{\mathrm{sb,B}}(\nu)$	MJS	ignored	01-Feb-03
Normalization	1	$\hat{\Phi}_{\mathrm{sb,B,ch}}$	MJS	NA	01-Feb-03

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CALIBRATION DATA

Parameter	Priority	Symbol	Responsible Person	Current Status	Launch ready
SB fraction					
GHz	1	$r''_{\mathrm{sb,B,ch}}$	RFJ	pre-environment	01-May-03
THz	1	$r_{\mathrm{sb,B,ch}}$	HMP	pre-environment	01-Mar-03
Filter quadrature					
Non Magnetic	1	$H_R(\zeta_t, \mathbf{x})$	WGR	Preliminary	01-May-03
Magnetic	1	$H_{\mathrm{R1}}(\zeta_t, \mathbf{x})$	MJS	Non-Magnetic	01-May-03
Antenna Patterns					
GHz	1	$G_{\mathrm{l,1,21,32,34}}(\chi, \chi_o)$	REC	pre-environment	01-Apr-03
GHz	1	$G_{\mathrm{sb,2--6}}(\chi, \chi_o)$	REC	pre-environment	15-Apr-03
GHz	1	$G_{\mathrm{sb,7--9,33}}(\chi, \chi_o)$	REC	pre-environment	15-Apr-03
GHz	1	$G_{\mathrm{sb,10--14}}(\chi, \chi_o)$	REC	pre-environment	01-May-03
Note		$G_{\mathrm{sb,B,ch}}(\chi, \chi_o) = G_{\parallel,\mathrm{sb,B,ch}}(\chi, \chi_o) + G_{\perp,\mathrm{sb,B,ch}}(\chi, \chi_o)$			
R1A, R1B	1	$G_{\parallel,\mathrm{l,B,ch}}(\chi, \chi_o)$	REC	ignored	01-Apr-03
R1A, R1B	1	$G_{\perp,\mathrm{l,B,ch}}(\chi, \chi_o)$	REC	ignored	01-Apr-03

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CALIBRATION DATA

Parameter	Priority	Symbol	Responsible Person	Current Status	Launch ready
R1A, R1B	2	$G_{\vert,\mathrm{l,B,ch}}(\chi,\chi_o)$	REC	ignored	01-Aug-03
R1A, R1B	2	$G_{\circ,\mathrm{l,B,ch}}(\chi,\chi_o)$	REC	ignored	01-Aug-03
THz	1	$G_{\mathrm{B,ch}}(\chi,\chi_o)$	HMP	pre-environment	15-Jan-03
FOV-direction					
GHz	1	$\alpha_{\mathrm{sb,B}}, \epsilon_{\mathrm{sb,B}}$	REC	Pre-environment	01-Feb-03
THz(→GHz)	1	$\alpha_{\mathrm{sb,B}}, \epsilon_{\mathrm{sb,B}}$	REC	Pre-environment	01-May-03
THz(R5V→R5H)	1	$\alpha_{\mathrm{sb,B}}, \epsilon_{\mathrm{sb,B}}$	HMP	$\alpha_{\mathrm{sb,B}}=0, \epsilon_{\mathrm{sb,B}}=0$	Ready
Antenna losses and efficiencies					
GHz	1	$\eta^{\mathrm{AA}}_{\mathrm{sb,B}}, \eta^{k=1,2,3}_{\mathrm{sb,B}}$	REC	ignored	01-Mar-03
GHz	1	$\rho^{k=1,2,3}_{\mathrm{R}}$	REC	ignored	Ready
Notes		$\eta^{\mathrm{A}}_{\mathrm{sb,B}} = \eta^{\mathrm{AA}}_{\mathrm{sb,B}} \prod_{k=1}^{3} \eta^{k}_{\mathrm{sb,B}}$ $\rho^{\mathrm{A}}_{\mathrm{R}} = \prod_{k=1}^{3} \rho^{k}_{\mathrm{R}}$			
Polarization	1	$\xi_{\mathrm{B}=22,26}$	REC	ignored	01-May-03