Table 5. Local Continuum Slopes Removed From M^3 Spectra Prior to MGM Fits

Spectrum	Continuum Slope[a]	Continuum Offset	Tan λ Short[b]	Tan λ Long[b]
Mosc-9	9.80E-05	0.317	730	1700
Mosc-12	8.80E-05	0.248	730	1700
Mosc-16	1.57E-04	0.238	730	1700
Mosc-17	1.36E-04	0.298	730	1700
Mosc-18	1.29E-04	0.353	730	1700
Mosc-21	1.04E-04	0.169	730	1700
Mosc-22	9.40E-05	0.147	730	1700
Mosc-23	1.06E-04	0.146	730	1700
Mosc-24	8.10E-05	0.166	730	1700
Mosc-25	1.27E-04	0.137	730	1700
Cop-1	1.40E-04	0.113	730	1700
Cop-2	1.32E-04	0.087	730	1700
Cop-3	1.15E-04	0.076	730	1700
Cop-4	1.21E-04	0.071	730	1700
Cop-5	7.50E-05	0.105	730	1700
Cop-6	1.27E-04	0.089	730	1700
Cop-7	1.70E-04	0.120	730	1700
Cop-8	1.55E-04	0.079	730	1700
Cop-9	8.90E-05	0.051	730	1700
Arist-S1	5.30E-05	0.032	730	1700
Arist-S2	8.20E-05	0.077	730	1700
Arsit-S3	5.90E-05	0.052	730	1700
Marius-1	4.10E-05	0.089	790	1700
Marius-2	4.80E-05	0.062	790	1700
Marius-3	4.60E-05	0.062	790	1700

[a]Slope value assumes band shifts are in units of nm, and local continuum slopes are in units of reflectance/nm.
[b]Tan stands for tangent.

nature of the 2 μm absorptions suggest that the Marius olivine spectra exhibit minor contamination from pyroxene, although the pyroxene composition is uncertain. Pyroxene contamination would also help to explain the relatively narrow 1000 nm absorption, as well as the short-wavelength band minimum. The spectral variability between Marius and the other spectra evaluated suggests a different composition or lithological association.

5.2.2. Quantitative Spectral Diversity

[29] The MGM fits quantify the spectral variability illustrated in Figure 9. The relative predicted olivine compositions derived from the deconvolutions to the Moscoviense and Copernicus spectra are presented in Figure 11. As expected based on their overall similarity in Figure 9, the Moscoviense and Copernicus olivines are predicted to be quite similar in composition, although the spectral variability of the Moscoviense spectra is manifested in the larger range in estimated relative composition (~30 relative Fo # units). The Copernicus deconvolutions appear to be balanced by competing influences: the apparently strong but narrow long-wavelength absorption and the sharp feature near ~850 nm. The Aristarchus and Marius spectra are clearly olivine-rich, but the contamination from other phases prevents us from using MGM fits to predict the olivines' compositions, as discussed in section 5.2.3.

[30] Figure 11 also illustrates the error brackets determined using the methods described above in section 3.3.2. The error brackets in effect indicate the range of results obtained from various fitting procedures applied to a single

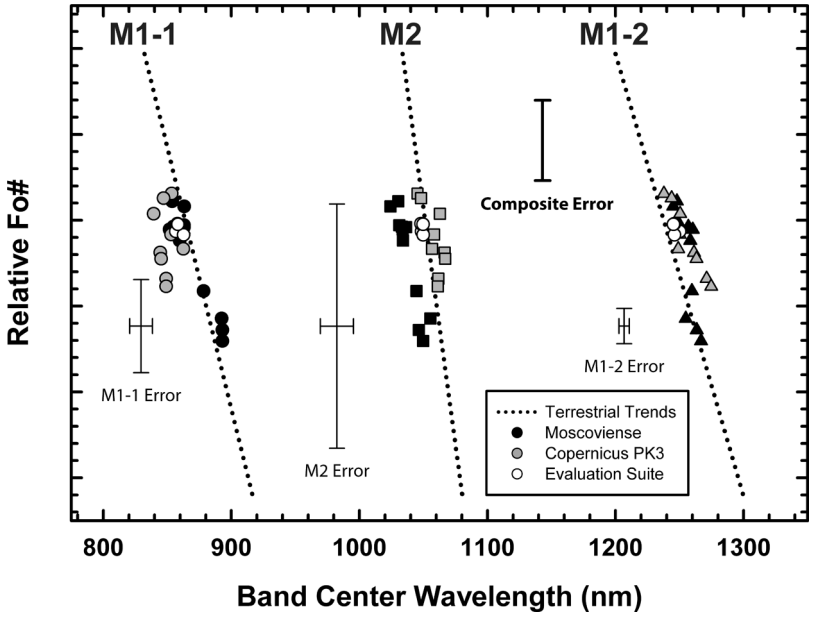

Figure 11. MGM-derived band center wavelengths and relative predicted compositions for the M^3 spectra analyzed in this study. The large ticks on the relatlive Fo # axis denote intervals of 20 relative Fo # units. The plotted results are reported in Table S1 in the auxiliary material. There is some deviation from the trends developed for terrestrial olivines by *Sunshine and Pieters* [1998], most notably for the central M2 absorption, but the overall agreement is reasonable. Error "range" brackets are reported for each component absorption (two-dimensional range) and for an overall range in predicted compositions. The composite error reflects the range in predicted composition when considering the ranges for each component absorption simultaneously. Error analysis is discussed more thoroughly in section 3.3.2.