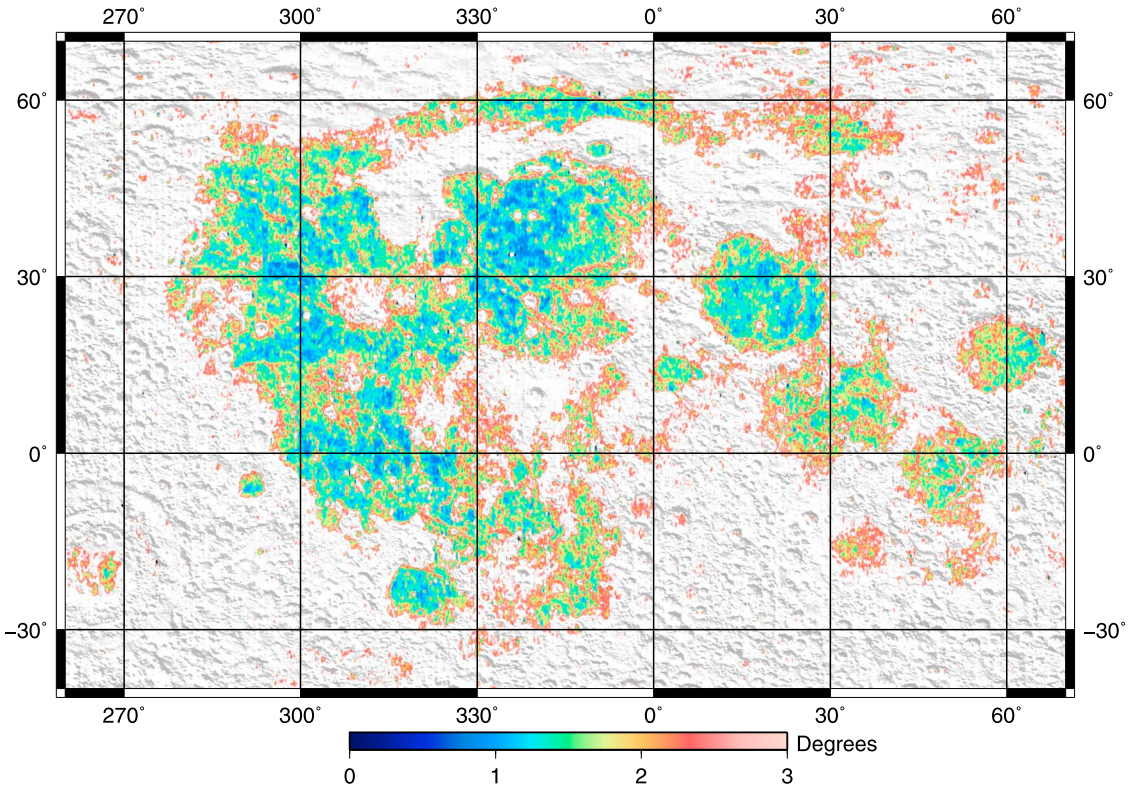

Figure 3. Median bidirectional slope, as described in Figure 2, with a color stretch designed to emphasize the subtle variations in slope within the lunar maria. Large-scale flow fronts and tectonic features such as wrinkle ridges appear as long, continuous regions of slopes higher than the surrounding plains and are most evident within the Imbrium, Crisium, and Serenetatis basins.

of the 1-D slopes, $F(p)$, and 2-D slopes, $F(s)$, are related by [*Aharonson and Schorghofer*, 2006]

$$F = \int_{|p|}^{\infty} \frac{F(s)}{\sqrt{s^2 - p^2}} ds. \quad (2)$$

In practice, this integral equation may be discretized and inverted. Figure 4 is a global comparison of our measured slopes in one and two dimensions and the adjusted point-to-point slope histogram. We find moderately good agreement between measured bidirectional slopes and those predicted from the 1-D slope distribution, although the 2-D measured slopes are slightly steeper than predicted from the 1-D distribution, typically by 25%. We can place constraints on two factors that contribute to this discrepancy. Anisotropy in our slope measurements occurs when triangles with high aspect ratios are used for plane fitting. LRO's orbital configuration creates a preferred direction for the long axis of these triangles, and because slopes are generally shallower at longer baselines, the azimuthal distribution is skewed to favor the perpendicular to the down-track direction. To minimize this effect, we included only triangles with low aspect ratios, using spots 1, 3, and 4. While some anisotropy remains, this consideration improves the agreement by nearly a factor of 2. Part of the discrepancy is also due to the fact that comparing slopes at similar baselines is rendered difficult by instrument constraints. The minimum baseline for point-to-point slopes (~25 m) is larger than the effective baseline of our preferred triangles (~17 m). As a result, bidirectional slopes have a tendency to be larger than their

Table 1. Statistical Estimators of Surface Roughness Properties for Major Lunar Geographic Regions[a]

	Highlands	Maria	South Pole-Aitken Basin: All	South Pole-Aitken Basin: Floor	South Pole	North Pole
Median slope at the ~17 m effective baseline (deg)	$7.5^{+12.3}_{-4.2}$	$2.0^{+4.1}_{-1.0}$	$7.2^{+12.0}_{-3.0}$	$5.8^{+10.5}_{-3.0}$	$7.6^{+12.4}_{-4.2}$	$6.9^{+11.5}_{-3.8}$
Median Hurst exponent	$0.95^{+0.97}_{-0.92}$	$0.76^{+0.85}_{-0.63}$	$0.95^{+0.97}_{-0.93}$	$0.94^{+0.97}_{-0.91}$	$0.95^{+0.97}_{-0.92}$	$0.94^{+0.96}_{-0.91}$
Median breakover scale (km)	$0.98^{+1.13}_{-0.74}$	$0.53^{+0.97}_{-0.24}$	$1.01^{+1.14}_{-0.81}$	$1.01^{+1.15}_{-0.82}$	$1.01^{+1.15}_{-0.79}$	$0.97^{+1.12}_{-0.73}$
Typical deviogram shape(s)	Monofractal, bilinear	Complex	Monofractal, bilinear	Monofractal, bilinear, complex	Monofractal, bilinear	Monofractal, bilinear, complex

[a]The median value is reported along with the 25% and 75% percentile points as a measure of the width of each distribution.