Table 4. Parameters Calculated From the Reference Points in Table 3[a]

Name	D_r	d	h_{floor}	h_{pr}	h_{wall}	h_{flank}	W	S (°)	V_1 (km^3)	V_2 (km^3)
		Derived Parameters								
						Peak-Ring Basins				
Schwarzschild	207	3.01(+0.58, −0.85)	0.20 (+0.14, −0.19)	0.63 (+0.39, −0.39)	2.68 (+0.66, −0.63)	0.73 (+1.37, −0.89)	26.65 (+4.03, −5.92)	6.33 (+2.12, −1.28)	0.80 (+0.17, −0.22) × 10^5	0.81 (+0.19, −0.24) × 10^5
D'Alembert	232	4.60 (+0.41, −0.51)	0.65 (+0.15, −0.16)	0.42 (+0.19, −0.25)	3.94 (+0.37, −0.40)	1.78 (+1.02, −0.58)	28.55 (+3.55, −4.86)	7.87 (+0.98, −0.92)	1.45 (+0.19, −0.17) × 10^5	1.50 (+0.14, −0.19) × 10^5
Bailly	299	4.13 (+0.79, −1.10)	0.68 (+0.27, −0.40)	1.13 (+0.39, −0.49)	3.46 (+0.91, −0.98)	3.38 (+1.55, −1.28)	30.44 (+8.05, −9.83)	6.38 (+1.84, −0.97)	2.18 (+0.57, −0.50) × 10^5	2.33 (+0.47, −0.61) × 10^5
Schrödinger	326	3.98 (+1.12, −0.80)	0.35 (+0.33, −0.19)	1.34 (+0.69, −0.78)	3.61 (+0.89, −0.69)	1.50 (+1.44, −1.65)	35.30 (+6.40, −5.39)	5.96 (+1.13, −1.30)	2.58 (+0.90, −0.47) × 10^5	2.47 (+0.60, −0.45) × 10^5
Mendeleev	331	5.54 (+0.77, −0.57)	0.26 (+0.28, −0.22)	0.80 (+0.51, −0.47)	5.23 (+0.57, −0.52)	2.43 (+1.18, −0.81)	42.88 (+4.44, −4.50)	6.92 (+1.23, −0.92)	3.58 (+0.77, −0.45) × 10^5	3.63 (+0.62, −0.43) × 10^5
Korolev	417	4.70 (+0.59, −0.70)	0.66 (+0.54, −0.33)	1.42 (+0.59, −0.93)	3.91 (+0.43, −0.53)	3.57 (+1.68, −1.24)	42.88 (+6.10, −3.79)	5.19 (+0.62, −0.65)	5.06 (+0.85, −0.97) × 10^5	5.02 (+0.73, −0.79) × 10^5
Moscoviense	421	6.40 (+0.47, −0.54)	1.60 (+0.50, −0.85)	3.73 (+0.78, −0.79)	4.79 (+0.74, −0.62)	2.06 (+1.13, −1.16)	49.99 (+4.50, −6.16)	5.58 (+1.07, −0.74)	5.90 (+1.57, −0.99) × 10^5	5.76 (+0.60, −0.66) × 10^5
Apollo	492	4.77 (+1.03, −2.34)	1.28 (+0.32, −0.76)	2.93 (+0.50, −0.56)	3.33 (+1.04, −1.30)	−0.58 (+2.26, −1.92)	42.29 (+11.13, −14.57)	4.51 (+0.99, −1.01)	6.50 (+2.49, −3.03) × 10^5	6.81 (+1.87, −4.09) × 10^5
						Protobasins				
Antoniadi	137	4.09 (+0.42, −0.42)	0.62 (+0.10, −0.13)	0.64 (+0.63, −0.36)	3.49 (+0.36, −0.37)	1.64 (+0.46, −0.94)	18.95 (+3.08, −3.32)	10.67 (+1.77, −1.53)	4.20 (+0.90, −0.65) × 10^4	4.56 (+0.62, −0.62) × 10^4
Compton	166	2.40 (+0.84, −0.52)	0.10 (+0.13, −0.14)	0.24 (+0.23, −0.16)	2.35 (+0.71, −0.48)	0.67 (+1.54, −0.69)	22.98 (+3.32, −3.32)	5.98 (+1.15, −0.97)	3.90 (+1.47, −0.75) × 10^4	3.74 (+1.64, −0.89) × 10^4
Hausen	170	5.93 (+0.46, −0.60)	0.53 (+0.20, −0.14)	0.28 (+0.14, −0.11)	5.35(+0.37, −0.57)	4.06 (+2.00, −0.84)	30.80 (+4.50, −3.08)	9.37 (+1.35, −1.04)	8.59 (+1.56, −1.51) × 10^4	9.02 (+0.92, −1.21) × 10^4

[a]All values are in kilometers except where denoted. Formulas for calculating these parameters are given in Table 2. The numbers in parentheses given for each parameter are the interquartile range for each parameter.

as *WZ*98) have provided the most comprehensive catalog of basin depths, but the accuracy of these measurements were limited by the quality of the Clementine lidar data and did not completely account for the substantial azimuthal variation in topography. *WZ*98 used individual orbital tracks from the Clementine lidar instrument and determined the depth as the difference between the center elevation, determined from all tracks crossing the central portion of the basin, and the rim-crest elevation, taken as the mean of all rim-crest elevations from each orbital track. Large uncertainties in these measurements are introduced from the limited number of orbital tracks crossing each basin and the coarse spacing between individual data points. *WZ*98 also used the mean values of rim-crest elevations, which is not a robust location parameter considering the non-normal distributions of the sample set (Figure 7 and section 3). As a result of these differences in methodologies and data sets, our median depth measurements (Table 4) have percent differences that range from 11% to 30% (mean = 22%) from the depths of *WZ*98 measured for the same basins. These differences are also systematically smaller than *WZ*98, which may be related to our use of the median statistic and inclusion of measurements across a wider range of azimuths. In addition, several workers have begun to use LOLA topography to examine the depths of lunar basins [*Sori and Zuber*. 2011], but systematic geometric measurements of basins exhibiting peak-ring morphologies have yet to be conducted.

[31] Given the large azimuthal variation in basin topographies, our new depth data show general agreement with the *WZ*98 trend but with systematically smaller depths, ranging from 3.01 km to 6.40 km (Figure 9a). Schwarzschild, the smallest peak-ring basin, plots well below the *WZ*98 line, diverging more from the *WZ98* trend than all other peak-ring basins. Interestingly, the protobasin, Compton, also plots well below the *WZ*98 line and appears to form the tail end of a power law trend with peak-ring basins (Figure 9a). If this trend is real, it is steeper than the trend determined by *WZ*98, predicting shallower depths of 1–2 km at the smallest basin sizes (Figure 9a). The depths of peak-ring basins are also smaller than extrapolation of the trend of depths for complex craters >15 km determined by *Pike* [1974] (Figure 9a). The depths of Antoniadi and Hausen are more comparable to the *Pike* [1974] trend for complex craters, suggesting an incomplete transition to peak-ring basins. The ratio of depth to diameter is also observed to decrease with increasing rim-crest diameter for peak-ring basins (Figure 10a).

[32] While our measurements of the basin depth are statistically more representative than previous depth measurements, it is unclear whether the steeper depth-diameter trend revealed for peak-ring basins and the protobasin, Compton, (Figure 9a) is a real product of the impact process and transition to peak-ring basins or the result of variations in crater degradation process or impact conditions. The formation of this trend relies on only two basins, Schwarzschild and Compton, and it is not a statistically confident interpretation of the entire data set. In order to make a more informed interpretation of the trend revealed by our new depth data, we now discuss several factors that may be contributing to the small depth-diameter ratios at the smallest basin diameters, and in particular Schwarzschild and Compton.