Table 1. List of Peak-Ring Basins and Protobasins Used in This Study, Which are From the Catalogs of *Baker et al.* [2011a][a]

Name	Latitude[b]	Longitude[b]	D_r	D_{pr}	D_{cp}	Class	Number of Profiles			Notes
							Rim Buffer	Ring Buffer	Center Buffer	
				Peak-Ring Basins						
Schwarzschild	70.3554	120.0916	207	71	-	II	284	236	283	
D'Alembert	51.0543	164.8361	232	106	-	II	228	82	240	
Milne	−31.2532	112.7747	264	114	-	III	-	-	-	
Bailly	−67.1813	−68.7959	299	130	-	II	240	117	195	
Poincare	−57.3193	163.1533	312	175	-	IV	-	-	-	
Coulomb-Sarton	51.3494	−122.5339	316	159	-	IV	-	-	-	
Planck	−57.3913	135.0916	321	160	-	III	-	-	-	
Schrödinger	−74.9047	133.5332	326	150	-	I	327	360	360	mare
Mendeleev	5.4436	141.1357	331	144	-	II	243	118	303	
Birkhoff	58.8803	−146.5760	334	163	-	IV	-	-	-	
Lorentz	34.2963	−96.9955	351	173	-	IV	-	-	-	
Schiller-Zucchius	−55.7155	−45.1765	361	179	-	IV	-	-	-	
Korolev	−4.4430	−157.4701	417	206	-	II	219	173	124	
Moscoviense	26.3355	147.3612	421	192	-	I	241	126	297	mare
Grimaldi	−5.0105	−68.6893	460	234	-	IV	-	-	-	
Apollo	−36.0934	−151.4845	492	247	-	II	192	114	272	mare
Freundlich-Sharonov	18.3493	175.0039	582	318	-	IV	-	-	-	
				Protobasins						
Antoniadi	−69.3530	−172.9644	137	56	6	I	360	234	360	mare
Compton	55.9219	103.9596	166	73	15	I	360	288	360	mare
Hausen	−65.3381	−88.7572	170	55	31	I	352	243	233	

[a]Given are the measured diameters (in kilometers) of the rim crest (D_r), peak ring (D_{pr}), and central peak (D_{cp}) (for protobasins) and the center coordinates for each basin, as determined by *Baker et al.* [2011a]. The degradation class for each basin is listed, as well as the number of profiles used within each buffer for determining the profile and basin statistics. Only those basins with degradation classes of I or II were used in our analysis. We also note those basins with mapped mare deposits.

[b]Latitudes are positive northward and negative southward. Longitudes are positive eastward and negative westward.

4.2. Individual Profile Statistics

[17] All radial profiles started at the basin's center coordinates as defined by *Baker et al.* [2011a] (Table 1). These center coordinates correspond to the centroid of a circle fit to the basin's rim crest and are assumed to best represent the basin center without any a posteriori information obtained from subsequent calculations. We then specified the range of each profile, the azimuthal interval and any "exclusion zones." All profiles were set to a range of 3.5 times the rim-crest radius as measured by *Baker et al.* [2011a]. As mentioned above, topographic profiles were offset by 1° azimuth intervals and were not extracted over pre-defined "exclusion zones" within each of the three buffer zones (Figure 2).

[18] For each profile, we defined the locations and elevations of five reference points for use in subsequent calculations, including the center, peak ring, wall base, rim crest and target (Figure 2 and Tables 2 and 3). These reference points were selected to calculate the main topographic properties traditionally used in the topographic characterization of craters [*Pike*, 1976] (Figure 1). All reference points, except for the wall base and the distance to the target reference point, were located within pre-defined buffer zones (Figure 2), set as percentages of the measured rim-crest and peak-ring diameters from *Baker et al.* [2011a] (Table 1). These buffer zones were included to account for the uncertainties in locating maximum rim-crest and peak-ring elevations along the profile and also to reduce the statistical effect of extreme local topographic variations.

[19] The rim-crest buffer was set to ±5% of the rim-crest radius, which corresponds to the estimated error in the rim-crest diameter measurements of *Baker et al.* [2011a]. The rim-crest reference point was then defined as the maximum elevation point within the rim-crest buffer (Figures 2b, 3, and 4). The peak-ring buffer was set to ±30–40% of the peak-ring radius, which accounts for uncertainly in the measurement of peak-ring diameter and the significant offset that occurs between the centroid of a circle fit to the basin's peak ring and rim crest (see section 5.6 and Table 6). The peak-ring reference point was then defined as the maximum elevation point within the peak-ring buffer (Figure 3b and 4). A center buffer was also set, starting from the basin's center coordinates to 15% of the rim-crest radius, which was found to be a reasonable distance for obtaining a statistically representative center elevation without incorporating peak-ring material in the measurement. For protobasins, which have a central peak, the center buffer was modified to extend from a distance equal to two times the radius of the central peak (Table 1) to the lower limit of the peak-ring buffer. The target buffer was set to ±5% of the rim-crest radius to smooth out the effects of simple craters (<20 km in diameter) falling within the target buffer. Elevations for the center and target reference points were calculated as the median of all elevation points within the buffers, with uncertainties calculated as the interquartile range of these elevation points (Table 2). The distance to the target reference point was set to 3 basin radii from the center reference point (Table 3). This value is about one crater radius beyond the estimated ejecta width determined by *Pike* [1977] and should therefore be dominated by the topography of the pre-impact target surface. However, the pre-impact topography has been highly affected by superposed impact craters, making accurate determination of the elevation of the target reference point difficult (section 5.2). No buffers were set for determining the elevation and distance to the wall-base reference point due to the difficulty in