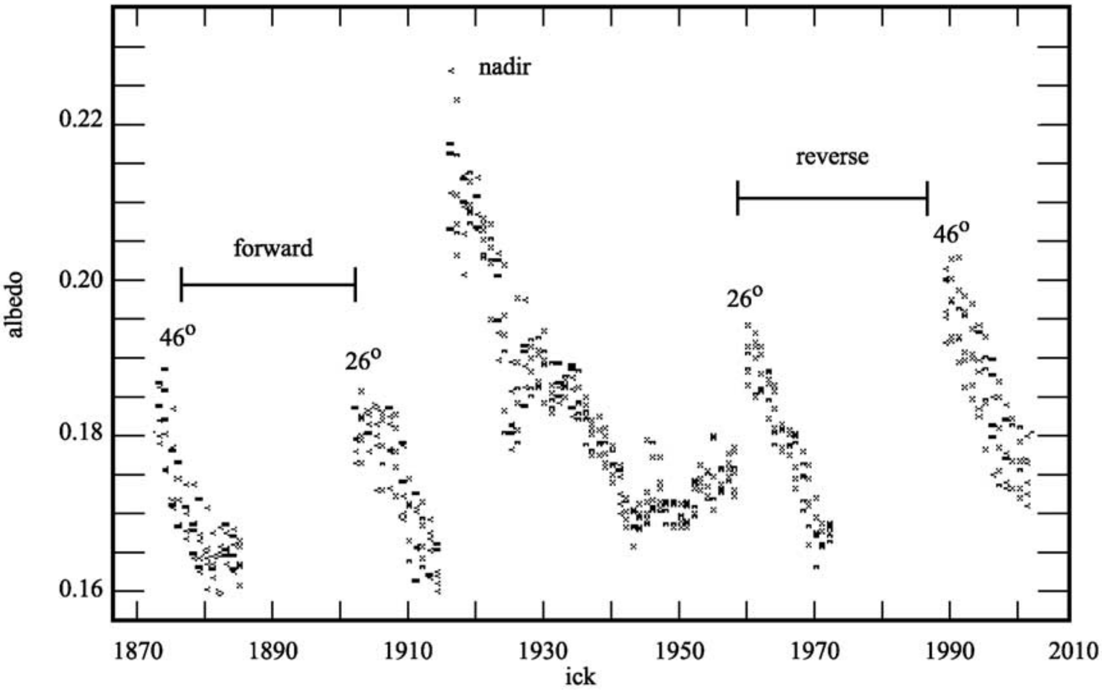

Figure 10. Plot of albedo versus Incremental Counter Keeper (ICK) for an EPF mosaic of the MP landing site. EPF observations at higher emission angles do not result in a significant decrease in surface albedo, i.e., increase in rock observations, at the landing site. This is due to the increased amount of atmospheric dust observed with increasing emission angle observations.

of the respective surfaces. The coarsest basalt material near the center of the crater floor may grade to finer surface type 2 material transported further downwind (southward) and partially up crater walls. The deconvolved andesite and weathered basalt mineralogies for surface type 2 contain significantly more glass and/or clay compared to surface type 1 basaltic materials. In a physical weathering environment, such as the eolian regime that transported material along the floors and up onto the walls of craters, lithologies containing glass and/or clay (surface type 2) will break down into smaller particles compared to lithologies with less modal abundances of these components (surface type 1). The mineralogies of the two surface types blown into impact craters may thus control their observed distribution.

[42] Another hypothesis to explain the origin of low-albedo impact crater wall material is that surface type 2 is being eroded and is cascading downward from layers within crater walls, instead of being transported upward. In this scenario, surface type 2 material is indigenous to the crater wall lithology. MOC and MOLA data have been used to show that some crater walls are covered by what appears to be loose, granular material that is at the angle of repose near crater rims [*Edgett and Malin*, 2000]. Furthermore, outcrops and streaks in crater walls have been observed to run downslope, suggesting that surface type 2 material may be eroding and sliding down the slope surface. The andesite interpretation for surface type 2 would suggest the existence of in-place andesite layers in crater walls. This model is consistent with the Mars Pathfinder conclusion that the material in this region is andesitic in composition [*Rieder et al.*, 1997; *McSween et al.*, 1999].

[43] The weathered basalt interpretation for surface type 2 is also consistent with an indigenous model for material on crater walls. In this scenario, in-place lithologies are altered by sub-aerially emplaced ice and/or water layers and later eroded downwards forming loose material. All material within impact craters is thus originally basalt, as either transported floor material or indigenous wall exposures, with altered basalt forming later and eroding from crater walls. It is uncertain if this type of weathering process is currently altering crater wall surfaces; however, Mars Odyssey Gamma-Ray Spectrometer data [*Feldman et al.*, 2002; *Mitrofanov et al.*, 2002; *Boynton et al.*, 2002] and high-resolution MOC images of pitted and hummocky surfaces [*Mustard et al.*, 2001] suggest the presence of stable near-surface water ice and recent modification of surface materials.

[44] In summary, it is difficult to trace the origin of surface type 1 basalt materials on the floors of impact craters to bedrock exposures because of their mobile nature and eolian origin. It is even more difficult to tie surface type 2 compositions (andesite or weathered basalt) to bedrock exposures because of the uncertainty about whether their sources lie inside or outside the craters, or if they represent local or global source compositions.

5.2.2. Low-Albedo Impact Crater Wind Streaks

[45] Several hypotheses exist for the origin of adjacent low-albedo wind streaks. Some models interpret them as resulting from saltation and traction and to consist of sandy material deflated from adjacent dark intracrater deposits [*Arvidson*, 1974; *Thomas*, 1984], or to result from material being stripped from the surface to reveal a darker substrate