Recent upgrades to the Particle ID (PID) algorithm which utilizes dual-polarization weather radar data, include improving the distinction of ice crystals from super-cooled liquid water (SLW) and expanding the SLW category to include a full range of sizes from cloud droplets to large drizzle drops. The SLW category in the past consisted only of the smallest drops and the larger drops were classified as drizzle or rain, which was confusing when it occurred above the freezing level. Previous improvements to the PID focused on the larger particles such as graupel and heavy rain. Optimization efforts have shifted to the smaller, more difficult to distinguish particles.

The improvement in SLW detection follows Vivekanandan et al. (1999) and it was implemented by Scott Ellis and Vivekanandan. Preliminary tests on IMPROVEII data show encouraging results. On November 11, 2001 the University of Washington Convair, research aircraft experienced icing while penetrating a cloud consisting mostly of SLW. Simultaneous observations with the NCAR S-Pol radar were performed allowing comparison to the aircraft. Figure 1 shows a RHI scan taken during the time when SLW was observed. It can be seen that the PID identifies the cloud as mostly SLW, in qualitative agreement with aircraft in situ observations. A more definitive study is in progress to compare in situ liquid water content and droplet size observation with the regions classified as SLW using polarization radar observations.

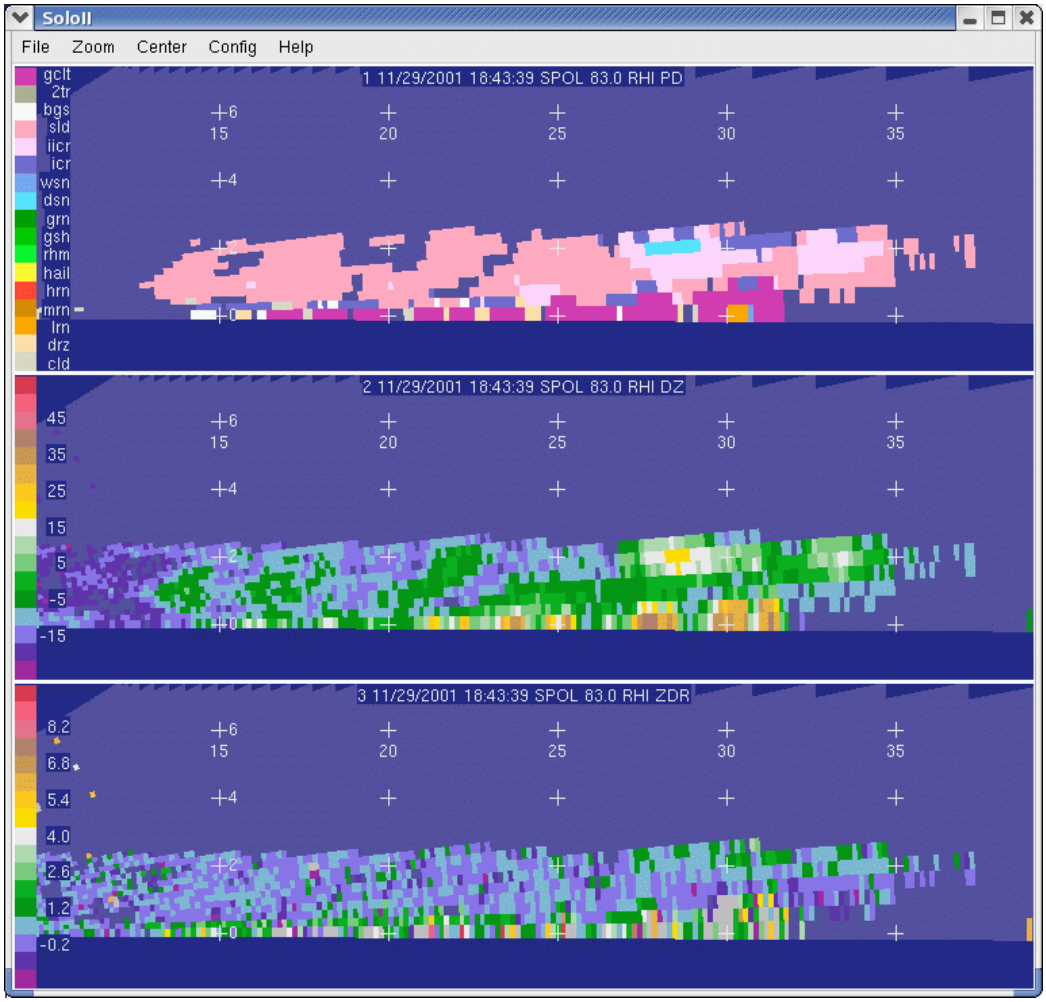

Figure 1. RHI from IMPROVEII showing PID results (top panel), reflectivity, dBZ (center panel) and differential reflectivity, dB (bottom panel). The observation was collected by S-Pol radar on November 29, 2001 near Oregon Cascades.