Raindrop size distribution (DSD) retrieval techniques using wind profiling radars are well established. Retrievals are typically performed using a VHF profiler (~55 MHz), or a combination of VHF (~55 MHz) and UHF (~920 MHz) profilers. The dual frequency technique can retrieve smaller drops than the single frequency technique, but suffers the obvious fiscal drawback of requiring two co-located profilers.

Single frequency retrievals are typically performed using boundary layer (BL) profilers, specifically designed to estimate winds in the lowest portion of the atmosphere. These radars generally have a small footprint, and large beam-width as a result. It is the large beam-width which prevents retrieval of the smallest drops. Larger footprint/smaller beam-width VHF radars typically have their first useable range gate near the freezing level in the mid-latitudes (~2 to 3 km) and so cannot be utilized in rainfall studies.

ATRAD Pty Ltd has recently developed a large footprint VHF profiler, which has its first useable range gate near 500 m. This instrument presents a unique opportunity to retrieve drop size distributions with a narrow beam-width. Preliminary results suggest this profiler is capable of retrieving smaller drops than other VHF profilers.

This work looks at DSD retrievals using a large footprint VHF profiler located at Buckland Park, South Australia. These retrievals are compared to retrievals from a co-located small footprint profiler, and the smallest drop size retrievable with each system examined. Steps towards real time DSD evaluation, and the potential to forecast flooding through examination of dominant microphysical processes are also discussed.