Inter-radar comparison accounting for partially overlapping volumes

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The Meteorological Service of Canada requires a reliable, accurate and automated radar network performance monitoring tool of inter-radar consistency. This requirement has increased priority due to recently announced funding for improvements to the radar network. Current implementations utilize simplified rules for sampling and comparing operational data. The main objective of this paper is to show a new methodology of sampling of comparable neighbouring radar data that will significantly improve the accuracy of inter-radar comparison.

A successful inter-radar comparison between adjacent radars is the synchronized measurement of the same equidistant volume space. In previous work we described how a geometric set of points at an equal distance from both radars could be accurately derived and create a common inter-radar space (CIS). However, the main beams from the adjacent radars never completely overlap in volume space, so this presentation extends the earlier work to allow for partially overlapping volumes. The intersection of the volumes produces a number of CIS points. A reliable operational inter-radar comparison tool has been developed accounting for the volume of CIS points as a weighting factor in the new Z algorithm comparison (ZAC) methodology. We present the benefit of the ZAC methodology with a case study.