

Interactive comment on “The NCAS Mobile Dual-Polarisation Doppler X-Band Weather Radar (NXPol)” by Ryan R. Neely III et al.

Anonymous Referee #1

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General comments

The paper is well written and while the use of mobile x-band radars in this field is well known, this paper does a good job of highlighting the availability of this specific resource, and its use in several field campaigns. I believe the utility of the paper to the community would be enhanced by addressing the concerns described below.

Specific comments

Abstract.

13: The use of “prevalent” seems to overstate the use of X-band radars, particularly in relation to the QPE. Perhaps clarify that this is in the mobile / research campaign area.

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1. Introduction

27: Again “ubiquitous” seems to overstate the use of x-band, particularly in relation to the QPE. It could perhaps be stated that this is the case for mobile applications but that this is not clear from this statement.

2. Technical 54 Summary of the NXPoI

2.1 Operations

75: Table 1 – Is the power per channel or pre-split? Please include the radar sensitivity. Ideally both of the receiver and the radar system as a whole.

03: DOP has been calculated for other systems previously (as per the work of Galletti, Bebbington, Holt, etc.) Please clarify how the calculation of DOP in this case is “unique”. Also, this capability seems interesting but is not mentioned further; for example, is it used in the field campaigns described? Is it found to be a useful parameter?

26: “They were also invaluable” – While it is clear how the data could be used in the aircraft case, it would be useful to describe how the data were used by forecasters - in what way were they invaluable?

2.2 Deployment Setup

41: The increased ease of health and safety could be mentioned at this point – consider a forward reference to section 2.3.

65: “now” - when exactly is this?

2.3 Safety

02: It would be useful for others considering such a setup if some details of the contingency plan could be given – how is this issue addressed in practice?

3. Example Deployments and Observations

3.1 COPE

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Figure 5: c) Spokes can be seen in the figure but are not referred to – what is this source of this artefact in this parameter alone?

Figure 5: d) the expanded colour bar label is difficult, if not impossible to read. Please revise.

3.2 ICE-D

Figure 6: Figure appears to be reversed. Presumably the thick black lines represent geographical features (islands) rather than meteorological ones – not actually stated. Is this data set publicly available? If so where? – If not please clarify the point being made in this and subsequent sections.

3.3 Radar Applications in Northern Scotland (RAINS)

88: It is unclear what conclusion one is to draw from the QPE in this figure; other than that different algorithms give different results - can this be clarified? It would be useful to state that one is making use of Kdp in the text rather than this having to be picked up from the figure label. Is a particular algorithm being used with the Kdp case? Does the use of Kdp improve comparison against ground truth?

Again – is this data set available? Were any conclusions drawn regarding the benefits of the X-band data in this area?

4. Ongoing Work at CFARR

Is this high quality dual wavelength data set available and if so, from where?

It is unclear to the reader, what the benefit/use of the lower resolution, more attenuation prone X-band data is in this case. i.e. what is gained by this dual wavelength validation of the HCA?

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