

## **5.12 IF INSECTS ARE THE PASSIVE TRACERS WE WANT THEM TO BE TO ESTIMATE WINDS, WHY ARE THEY GENERALLY ALIGNED?**

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Outside of the storm itself, the information provided by radar is generally limited to Doppler velocity from insect echoes. Past work have suggested that insects, particularly smaller ones, can be generally considered as passive tracers; as such, one can use their Doppler velocity as if it was a measurement of the wind.

We have just added dual-polarization capability to one of our vertically pointing radars, and one of the measurements we make is the differential reflectivity between the wave polarized in the east-west direction and that polarized in the north-south direction (“H” and “V” do not make sense when pointing vertically). While precipitation echoes are unaligned, most biological echoes in summer show a net alignment that varies with time and does not correspond with the direction of the wind. This suggests that, at least in Montreal in early August, most insects try to fly in a specific direction, and hence probably have net air speeds. If this finding is generalizable, the Doppler velocity obtained from such insects would then a biased estimate of the wind, affecting our ability to assimilate this data correctly.