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New insights on the prevalence of drizzle in marine stratocumulus clouds based on a machine learning algorithm applied to radar Doppler spectra

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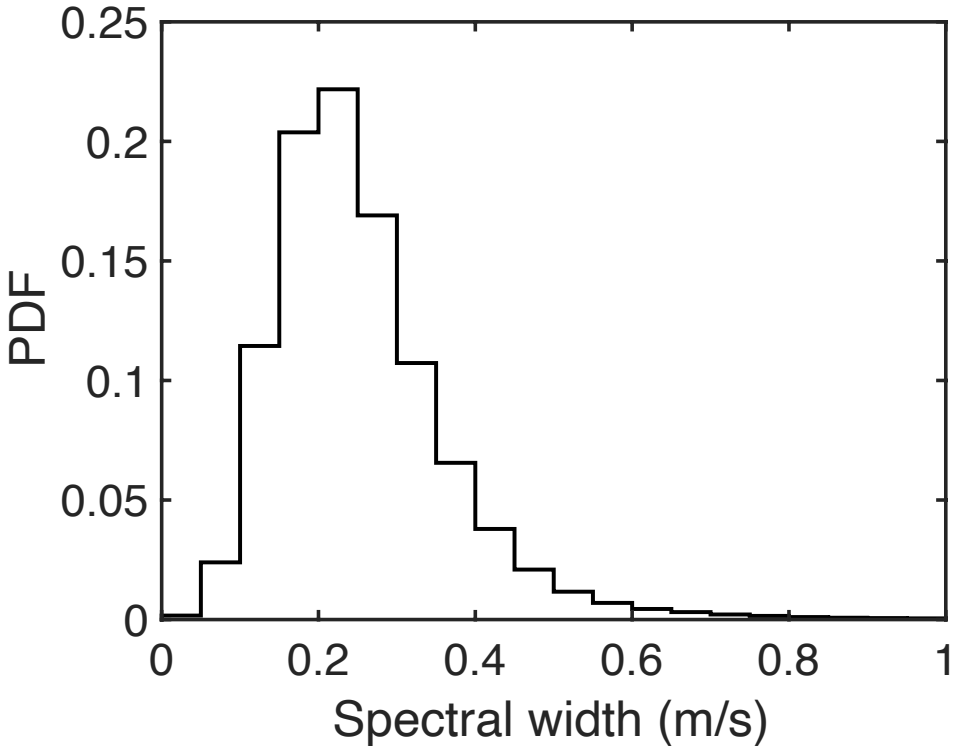

Figure S1: PDF of KAZR-observed spectrum width with reflectivity < -20 dBZ collected from the ACE-ENA IOP1 campaign.

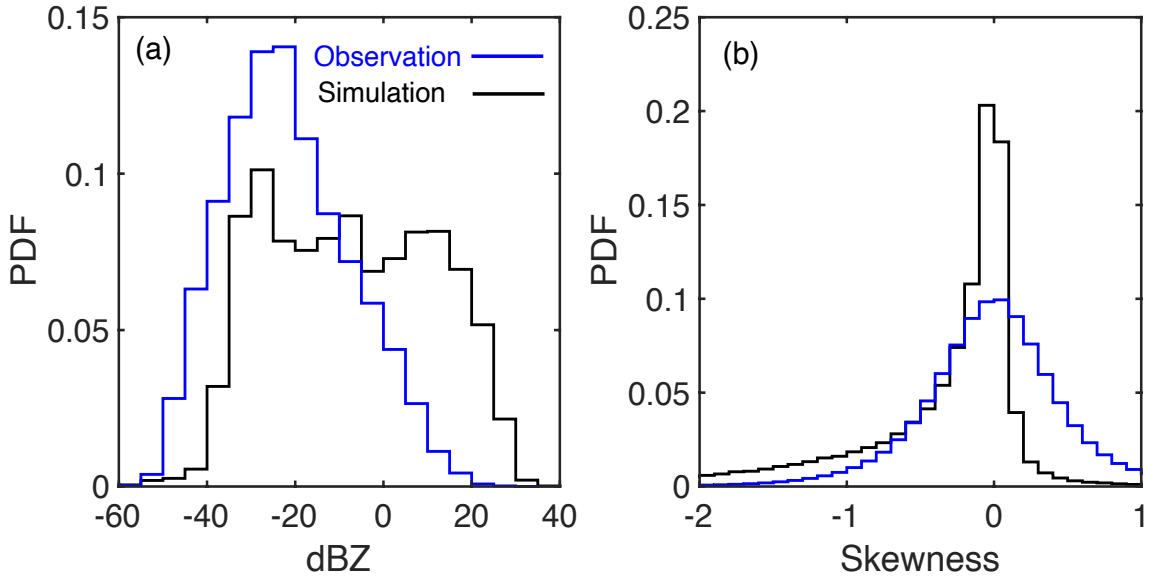

Figure S2: PDF of reflectivity (a) and skewness (b) from radar observation (blue line) and from the Doppler simulator (black line) with the setting indicated in the manuscript. The in-situ measurements and radar observation are obtained from ACE-ENA IOP1.

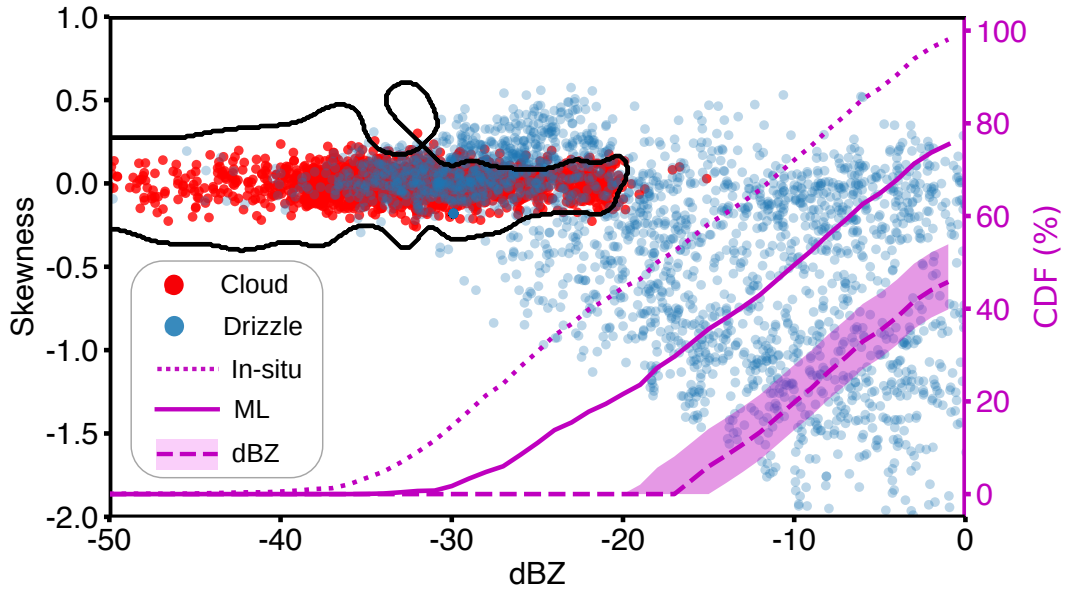

Figure S3: Same as Fig.2 but with C = 50 and !!"!#$%

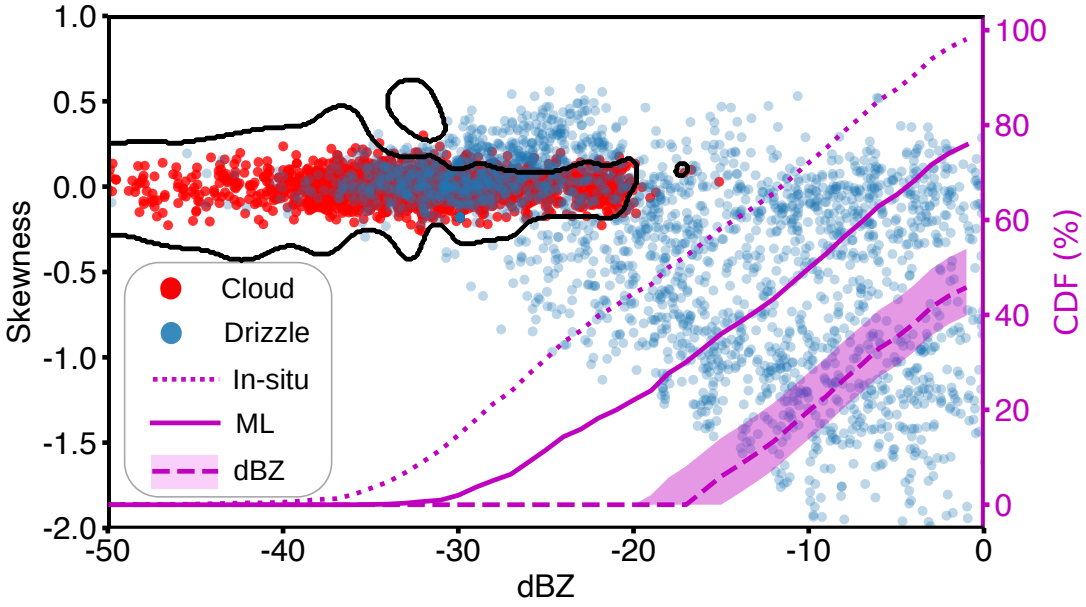

Figure S4: Same as Fig.2 but with C = 100 and !!"!#$%

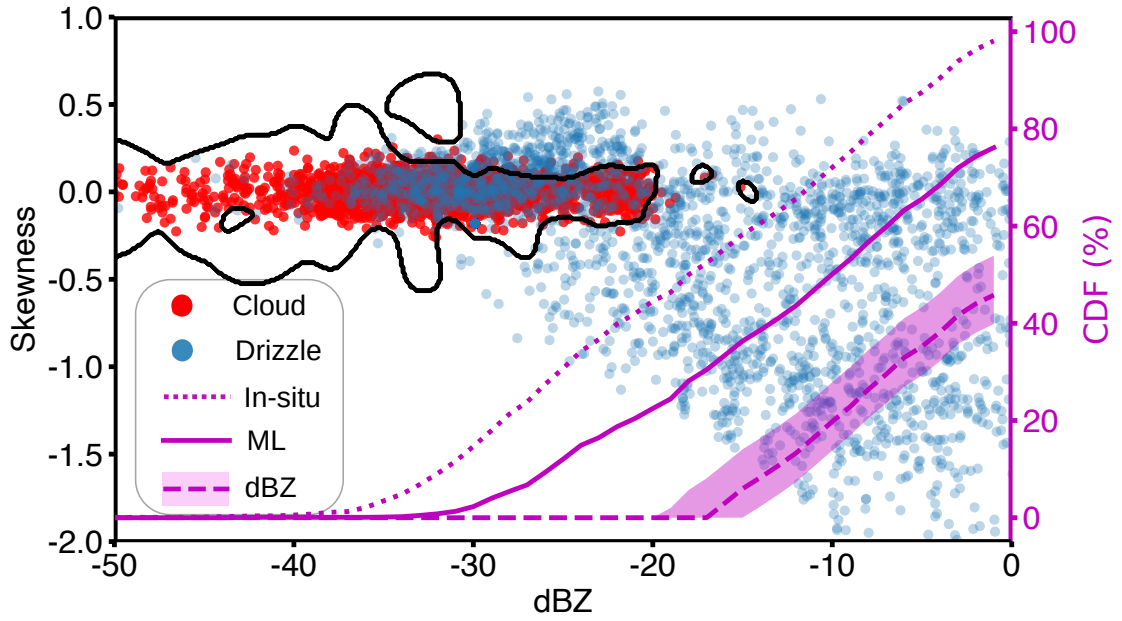

Figure S5: Same as Fig.2 but with C = 1000 and !!"!#$%

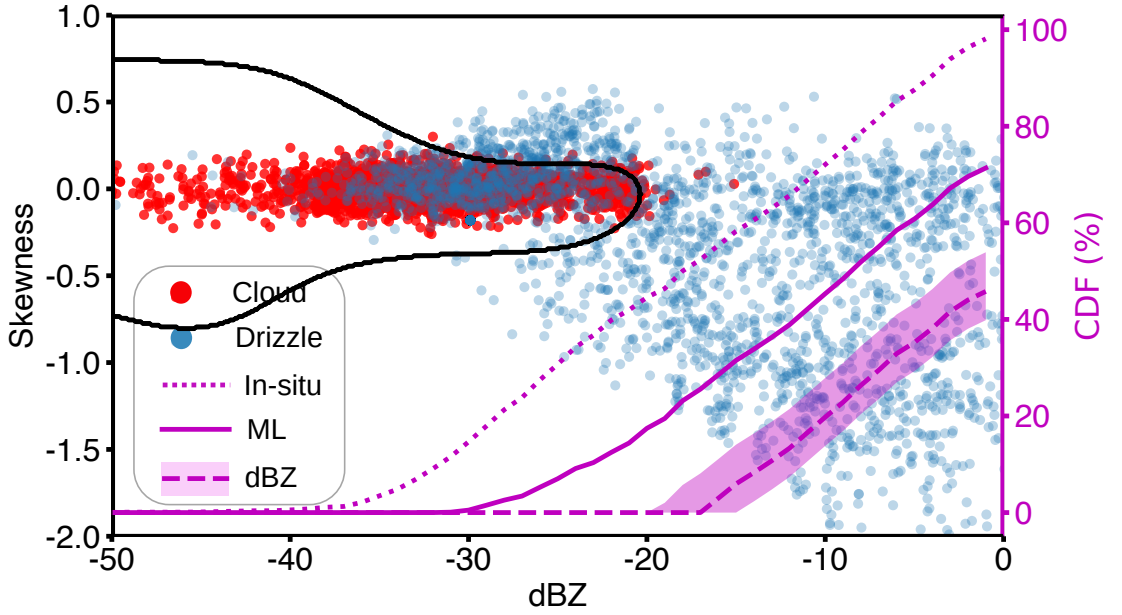

Figure S6: Same as Fig.2 but with C = 1 and !!"!&%

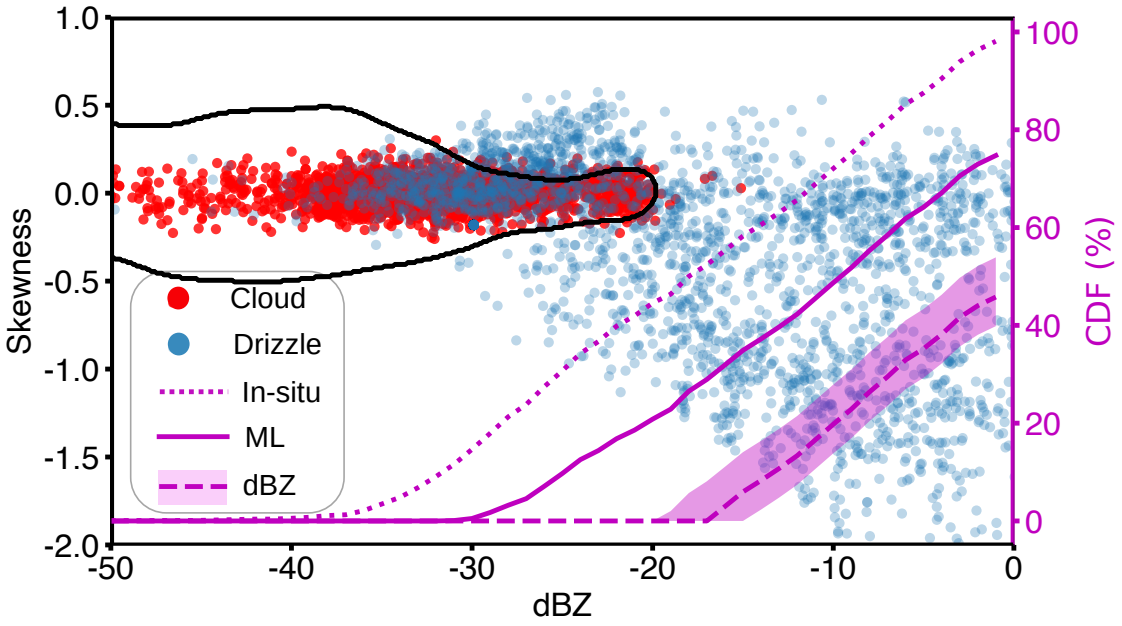

Figure S7: Same as Fig.2 but with C = 1 and !!"!&$%

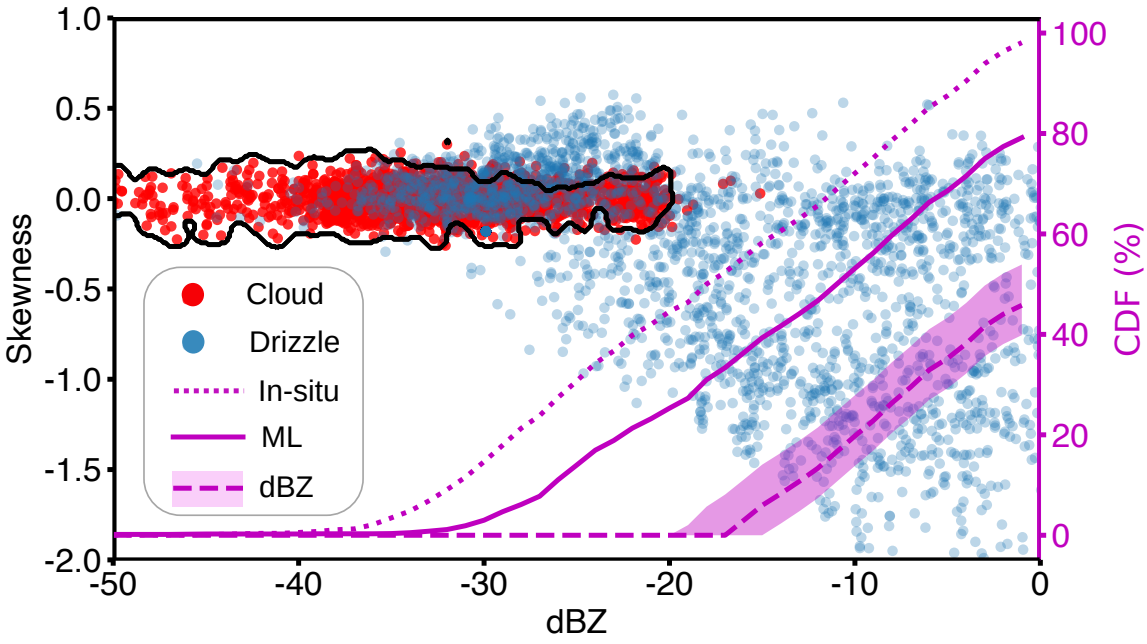

Figure S8: Same as Fig.2 but with C = 1 and !!"!'$$%

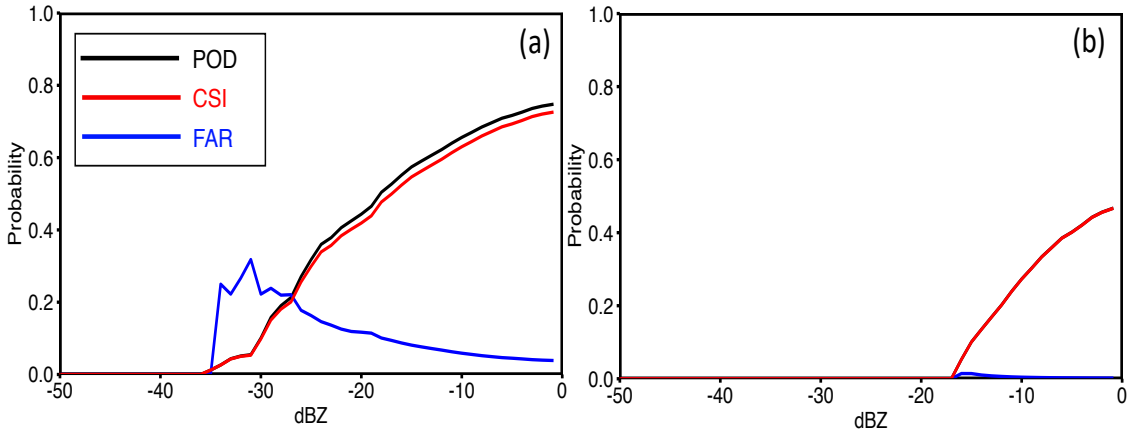

Figure S9: (a) Probability of detection (POD), False alarm ratio (FAR) and Critical success index (CSI) as a function of reflectivity for the ML-based drizzle detection algorithm. (b) Same as (a) but for the conventional method with reflectivity >-17dBZ.

POD, CSI and FAR are estimated as follows:

$$POD = \frac{TP}{TP + FN}$$

$$CSI = \frac{TP}{TP + FN + FP}$$

$$FAR = \frac{FP}{TP + FP}$$

Where TP, FN and FP represents True positive (i.e. the signal is labeled as drizzle and is detected as drizzle); False Negative (i.e. the signal is labeled as drizzle but is detected as cloud) and False Positive (i.e. the signal is labeled as cloud but is detected as drizzle).