SAR Software Comparison

Digital Earth

July 9, 2024

1 Radiometric Quality

1.1 Expected Values

If the software is calibrated correctly, the backscatter return should match the expected value for a target landcover from literature. We chose 16 observations over time for a test scene over a Queensland rainforest and plotted the mean and standard deviation of the pixels that are classified as rainforest in the DCCEEW landcover dataset.

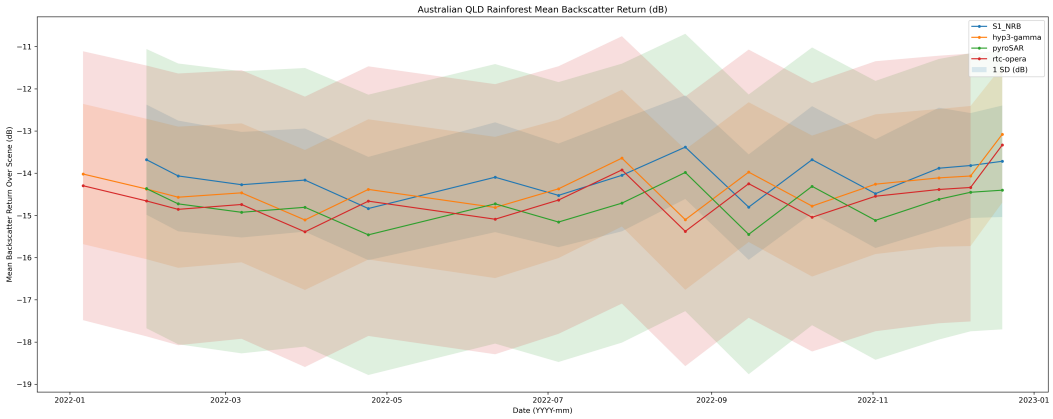

Figure 1: Mean (line plot) and standard deviation (shaded around the mean) VH backscatter return over time for the QLD rainforest test site. The values fall in the expected range of -15 to -12 dB literature.

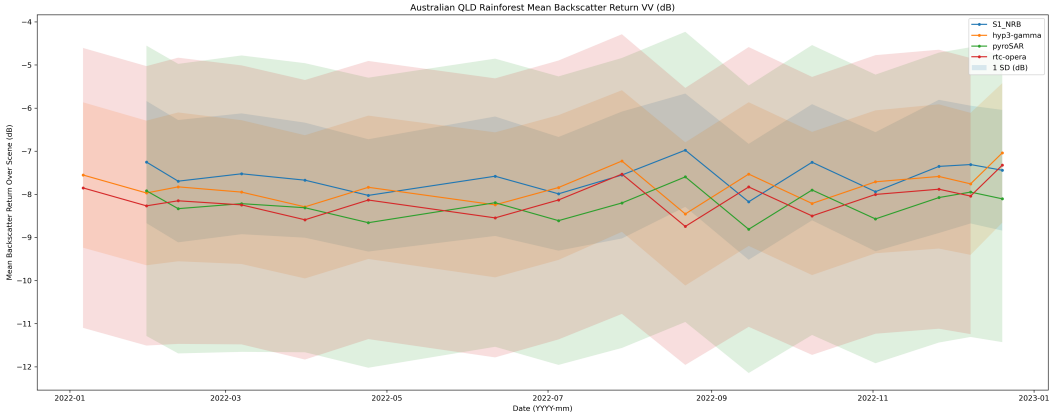

Figure 2: Same as Figure 1 for VV polarisation. The values fall in the expected range of -9 to -6 dB from literature.

2 Geometric Quality

2.1 Incident Angle Gradient

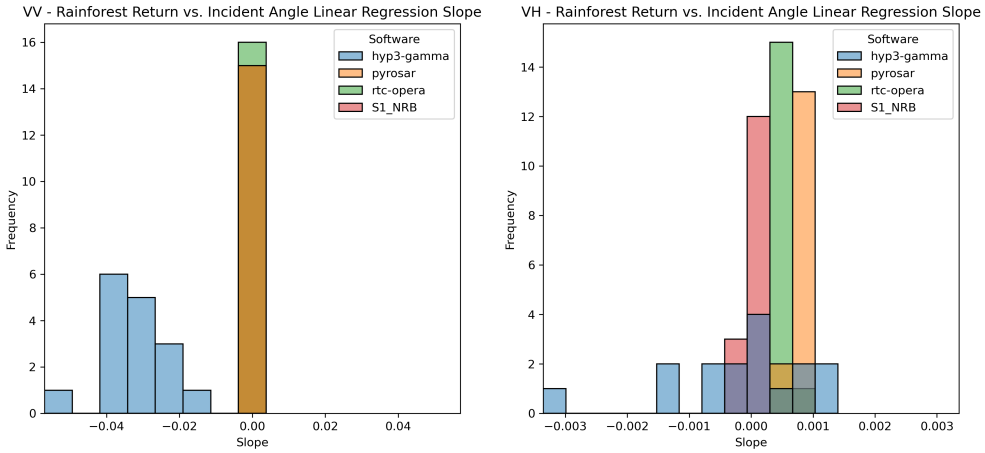

Figure 3:

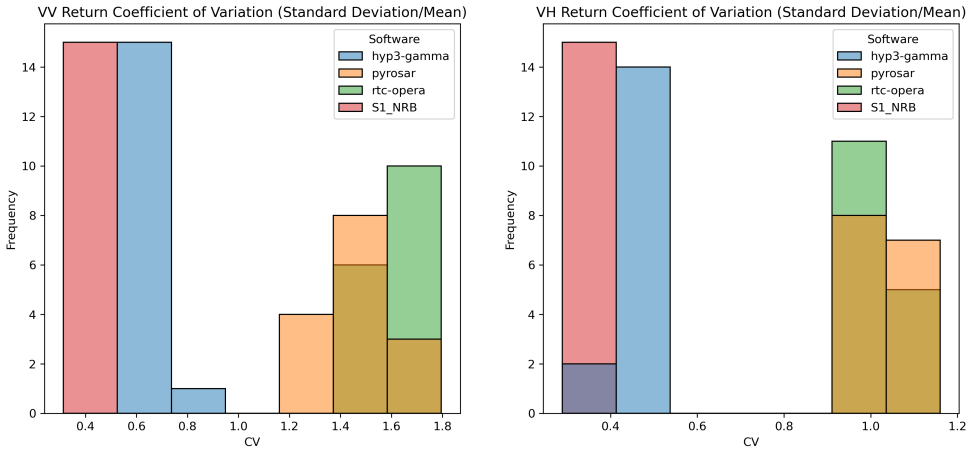

Figure 4:

3 Tabulated Summary of Results

Software	Season	Polarisation	Mean (dB)	CV	Slope
S1-NRB	Autumn	VH	-13.85	0.30	-3.67E-05
		VV	-7.37	0.36	-7.27E-04
	Spring	VH	-14.12	0.31	-2.17E-05
		VV	-7.67	0.35	-5.73E-04
	Summer	VH	-14.12	0.30	-4.58E-05
		VV	-7.62	0.34	-6.55E-04
	Winter	VH	-14.24	0.29	-4.87E-05
		VV	-7.62	0.34	-8.65E-04
hyp3-gamma	Autumn	VH	-14.15	0.44	-5.33E-04
		VV	-7.65	0.66	-3.75E-02
	Spring	VH	-14.45	0.45	9.29E-05
		VV	-7.97	0.68	-3.03E-02
	Summer	VH	-14.15	0.44	3.82E-04
		VV	-7.73	0.67	-2.66E-02
	Winter	VH	-14.52	0.45	-8.61E-04
		VV	-7.89	0.66	-4.12E-02
pyrosar	Autumn	VH	-14.49	1.06	8.02E-04
		VV	-8.02	1.58	3.58E-03
	Spring	VH	-14.80	1.00	7.54E-04
		VV	-8.33	1.37	3.30E-03
	Summer	VH	-14.76	1.00	7.52E-04
		VV	-8.26	1.37	3.43E-03
	Winter	VH	-14.87	1.09	7.33E-04
		VV	-8.26	1.60	3.35E-03
rtc-opera	Autumn	VH	-14.42	0.99	6.13E-04
		VV	-7.95	1.55	2.59E-03
	Spring	VH	-14.73	1.01	5.84E-04
		VV	-8.26	1.60	2.42E-03
	Summer	VH	-14.42	1.00	6.21E-04
		VV	-8.02	1.60	2.67E-03
	Winter	VH	-14.80	1.04	5.68E-04
		VV	-8.19	1.65	2.43E-03

3.1 How to add Citations and a References List

You can simply upload a `.bib` file containing your BibTeX entries, created with a tool such as JabRef. You can then cite entries from it, like this: [Gre93]. Just remember to specify a bibliography style, as well as the filename of the `.bib`. You can find a video tutorial here to learn more about BibTeX.

If you have an upgraded account, you can also import your Mendeley or Zotero library directly as a `.bib` file, via the upload menu in the file-tree.

3.2 Good luck!

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References

[Gre93] George D. Greenwade. The Comprehensive Tex Archive Network (CTAN). *TUGBoat*, 14(3):342–351, 1993.