

Wrap up

- WMO Radar Best Practice Guide
- Radar Network in Southeast Asia
- Country reports
- Basics of radar
- Maintenance and calibration of JMA radar
- Technical tour to Samut radar site
- **Dual-pol data utilization**
- Hail storm case study
- Doppler data utilization
- **Open source software (Pyrad)**

From your country reports

| | Radar Network (dual-pol) | Future Issues |
|----------------------|--------------------------|---|
| Bangladesh (BMD) | S-band network | Capa.Buil., QC, Replace Radar |
| Brunei (BDMD) | S-band (1) | Utilization of new radar |
| Cambodia (DoM) | S-band | Capa.Buil. Relocate radar, additional radar |
| Indonesia (BMKG) | C,X-band network (9) | Human resource, QC, Increase radar |
| Laos (DMH) | C-band | Capa.Buil., New radar, Radio interference |
| Malaysia (MMD) | S,C,X-band network (12) | QC, QPE |
| Myanmar (DMH) | S-band network | Capa.Buil., QC |
| Philippines (PAGASA) | S,C,X-band network (12) | Utilization of Disdrometer, Data assimilation, QC |
| Thailand (TMD) | S,C,X-band network () | Risk map, QPF, AI |
| Vietnam (VNMHA) | S,C,X-band network (5) | Utilization of dual-pol., QPF |

Utilization of dual-pol data

- Dual-pol data is useful for QPE, Hydrometeor classification and Quality Control (QC).
- Dual-pol data can handle ground clutter, sea clutter, non-precipitating echo (including wind farm) and bright band as QC.
- In order to get good performance, daily calibration / maintenance is essential.

Open source software (Pyrad)

- Free tool has so much potential to visualize data and get new products by yourself.
- It is necessary to become accustomed to its use by experimenting with various data.
- First, we need to prepare the data in a format that can be read by this tool such as CfRadial 1 (NetCDF) or ODIM_H5.
- The process of analyzing the data by yourself is very beneficial to know the character of your radar data.

Reference

WMO/CIMO guide (2021)

https://library.wmo.int/viewer/68661/download?file=8_III_2021_en.pdf&type=pdf&navigator=1

Volume III Chapter 7 Radar Measurements

Guide to Operational Weather Radar Best Practices

| Volume | Content | Draft Available |
|--------|--|-------------------------------------|
| I | Weather Radar Network Program Design | Provisional Edition |
| II | Weather Radar Technology | Provisional Edition |
| III | Weather Radar Procurement | Provisional Edition |
| IV | Weather Radar Siting, Configuration and Scan Strategies | Coming soon |
| V | Weather Radar Calibration, Monitoring and Maintenance | Coming soon |
| VI | Weather Radar Data Processing | Coming soon |
| VII | Weather Radar Data Representation and International Exchange | Provisional Edition |
| VIII | Weather Radar Glossary of Terminology | Planned |

<https://community.wmo.int/en/activity-areas/weather-radar-observations/best-practices-guidance>

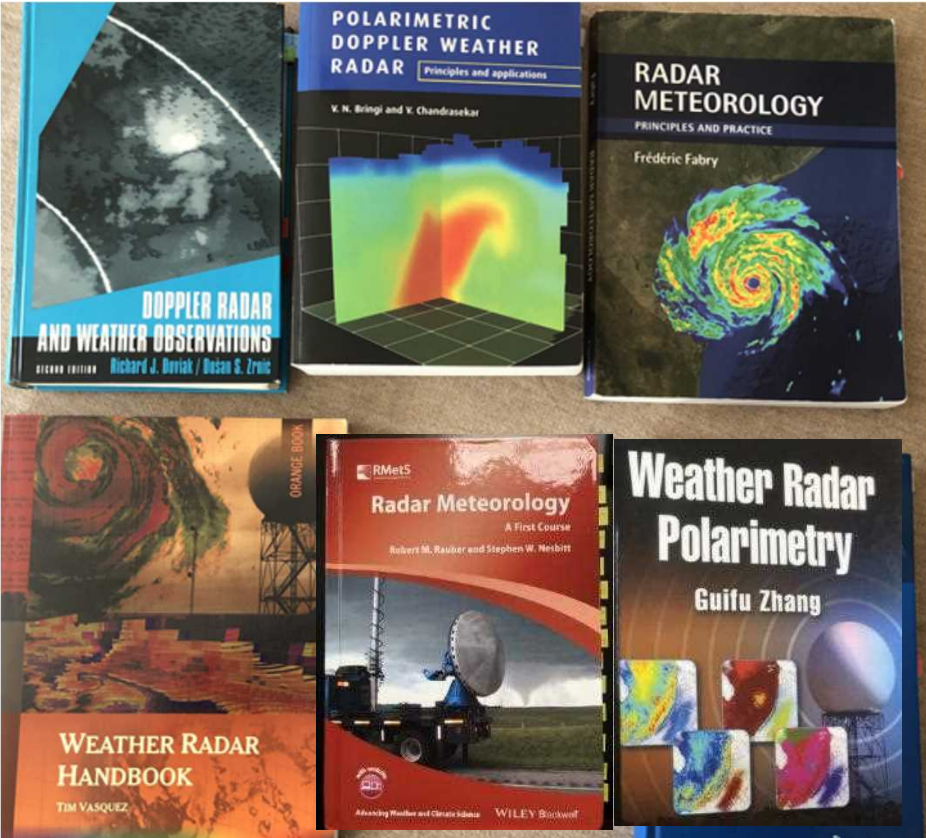
Appendix

■ Textbooks on Polarimetric Radar

1984、1993

2001

2015



2015

2018

2019

Please provide us your comment

- Which lecture is interesting / useful for you ?
- What is the reason its useful for you ?
- What kind of topic do you expect in the future workshop ?
- What is your plan to proceed after you come back to your office ?
- Do you have any other comments about this workshop ?