Notes from Group Discussion:

MODELLING APPLICATIONS

FRAM Workshop

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1. Nucleation processes and N_d

- Better parameterization or theoretical work to obtain accurate Nd
- It should be time dependent
- Predicting LWC is still an issue, inclusion of Nd is needed but can complicate the problem
- Skills in quantitatively predicting LWC needs to be searched

2. Operational NWP models scale issues/horizontal and vertical scales

- Clearly, current vertical resolution in NWP models is a serious problem for explicit fog forecasting
- Are high-resolution LAMs worth looking at – i.e. is there added value in high-reso (horizontal) models?
  - For fog, it appears that vertical resolution is more important than horizontal
- high-vertical-res 1-D models (e.g. COBEL) feasible?
  - Possibly, but they cost money (incorporating in situ observations)

RESEARCH towards short-term application is not clear

3. Why are the forecasts of LWC poor?

- **Vertical resolution**
- **Initial conditions**
- **Dynamics of the system e.g. velocity field**
- **reliable binary forecasts (fog vs. no fog; forget intensity) should be achieved before VIS is considered**

RESEARCH NEEDED

4. Microphysical schemes

- if fog is explicitly simulated, then treatment of droplets is important – microphysics details become more important
  - sedimentation
  - Autoconversion
  - Nucleation
- regional-scale models (dx ~15 km) should use sufficiently detailed microphysics scheme that accounts for precipitation processes
  - distinction between types of fog

5. Precipitation

- Fog and low-VIS situations (possibly without fog) occur during rain
- VIS should be parameterized as a function of precipitation rate and other microphysical related parameters
- For snow, Vis parameterizations become more complicated

6. Probabilistic vs. deterministic? RESEARCH / APPLICATION

- Ensemble fog forecast is desirable; due to high sensitivity to ICs???, parameters, etc., deterministic forecasts for fog forecasting need to be acknowledged

APPLICATIONS required

7. Surface conditions?

- Continued research on various surface related parameters and their sensitivity on fog occurrence and fog forecasting are needed.

- These parameters can be soil type, temperature, vegetation type, moisture, etc.