Assimilation of 'cloudy' satellite data

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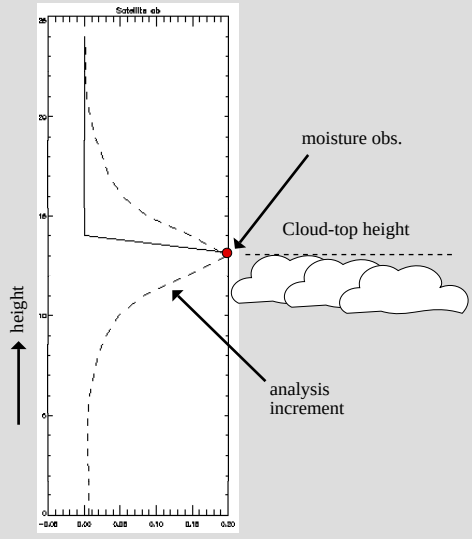
The issues

- Satellite obs in the IR & visible are affected by cloud.
- Cloud affected satellite obs are valuable, but are not used fully in d.a.:
  - Clouds complicate the assimilation of satellite data.
  - Observation operators can be highly non-linear when clouds are present (data assimilation requires linearity or near-linearity).
  - There are known problems inherent in current assimilation methods when dealing with moisture (see below).
  - Clouds often have a finer scale than the model can represent.
  - Forecast errors for cloud quantities are highly flow dependent and are not well known.
- Assimilation of moisture observations can help infer information about other quantities and could help improve the forecast of 'convective events'.

The project

- Use 1d-Var. as a test set-up.
- Diagnose cloud quantities from model variables - this will avoid the need to specify f/c errors for cloud quantities explicitly.
- Decouple cloudy levels from non-cloudy levels in **B**-matrix.



Courtesy Met Office