1. Strategic goals

- Hans-Ertel-Centre for Weather Research (HErZ)
  - Enhance scientific research and education at universities and DWD
  - Virtual center: five self-organized research groups (TB)

- Climate Monitoring Branch (HErZ-TB4)
  - Strengthen DWD’s capabilities in the assessment of the regional and local climate and its variability
  - Establish an operational climate monitoring framework as new data product at DWD

2. Reanalysis System

- Development of a high-resolution, regional reanalysis
  - COSMO-REA2: 2 km (current status: 2007–2014)
  - Output interval (150 fields): 15 min (2D), 60 min (3D)
  - Data assimilation on the regional scale
    - Operational nudging scheme: SYNOP, SHIP, PILOT, TEMP, AIREP, AMDAR, ACARS,…
    - Additional latent heat nudging (LHN) of RADAR on the 2-km scale
    - Towards ensemble data assimilation approaches (UERRA)

3. Evaluation

- Added value with respect to dynamical downscaling and/or spatial interpolation
  - Synthesis of heterogeneous observation networks
  - Physical consistency in space and time and between variables
  - Coherence with independent observations

4. Interesting characteristics

- Kinetic energy spectra
  - More energy on smaller scales for higher resolution
  - COSMO-REA2: good representation of k^{-5/3} spectrum
  - Effective resolution:
    - HIRLAM ~ 130 km
    - COSMO-REA6 ~ 50 km
    - COSMO-REA2 ~ 14 km

- Spatio-temporal precipitation patterns

Figure 1: HErZ reanalysis domains

Figure 2: Process cycle of the 6-km regional reanalysis system (COSMO-REA6)

Figure 3: Observed and simulated brightness temperature (10.8 µm) – COSMO-REA6 vs MSG

Figure 4: Horizontal kinetic energy spectra for different reanalyses.

Figure 5: Accumulated 24h-precipitation for different datasets over the Alps (June 21 2007)