Land surface Interactions with the Atmosphere over the Iberian Semi-arid Environment (LIAISE): 1st mesoscale modelling intercomparison

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16-18 July 2016

* clear skies, A conditions
* thermal heterogeneities
* locally/basin/mesoscale generated
winds (strongly interact)
* case representative of the
climatological features of the region

(Grau et al., 2021)

Models

MesoNH (MNH)

MOLOCH (MOL)

Unified Model (UM)

WRF



Model setup

- 36h run (from 16 July at 1800 UTC to 18 July at 0600UTC)
- 2 nested domains (1-way): 2km and 400m resolution
- Vertical resolution (2m and stretched above, 85 levels)
- Initial/Lateral BC: ECMWF



(i)

10m-wind speed (m/s) - 17th July 2016 at 0000UTC (results obtained from MesoNH model)

Winds are mainly from East during nighttime and from West during daytime CC I

Validation using AWS

Models are generally able to reproduce the wind patterns
 Most of the models present warm bias during nighttime







There are differences in the models regarding the surface ✓ surface model ✓ climatological database



²⁵ Validation using satellite-derived fields

Summary

- CC I
- The case 16-18 July 2016 is taken for intercomparison.
 ✓ Locally-generated circulations (interaction between local, basin, mesoscale)
- In general, models are able to reproduce the **wind patterns**.
- Modelled **temperatures** are overestimated during night-time.
- Differences in the models can be attributed to the different surface features (surface model & surface cover) but also to the atmospheric contribution (radiation, advection & turbulent schemes).



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