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Evolution of the energy budgets during a Sea-Breeze event in the island of Mallorca

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Observational and numerical studies show that the breeze in Mallorca (Western Mediterranean) is mostly generated in the three main basins: Palma and Campos in the South, and of Alcudia in the North. The size and topography of the island make that there is convergence of breezes in the centre of the island meanwhile the circulation is inverted during night-time.

In this work, the Campos basin is further analysed (4-6 June 2010) through a mesoscale simulation and the available observations. Furthermore, momentum, temperature and turbulence kinetic energy budgets are inspected, comparing the relative weight of each term and identifying which processes are more important in the different stages of the breeze cycle, to provide a comprehensive description of its evolution. It is found that turbulence is more important over the land than over the sea, specially during the mature phase of the breeze when the thermal and dynamical production play the most important role at lower levels and in the upper part the turbulence is nearly absent.