EGU21-8659
https://doi.org/10.5194/egusphere-egu21-8659
EGU General Assembly 2021

Observed mesoscale patterns in the irrigated Eastern Ebro basin

Antoni Grau Ferrer, Mª Antònia Jiménez Cortés, Daniel Martínez Villagrasa, and Joan Cuxart Rodamilans
University of Balearic Islands, Physics, Spain

The Eastern Ebro basin is composed of an extensive lower irrigated area, surrounded by dry-fed slopes and wooden mountain ranges to the North, East and South, while to the West is open to the agricultural Western Ebro basin. Previous studies, based on research data or on statistics for one station, indicate that these features determine the local circulations in the area. A network of stations is used here to analyze a period of 15 years, taking representative data for the different units of landscape. A filtering procedure is developed which selects the events with predominance of local circulations, based on detecting stably stratified nights.

The analysis of the filtered data indicates the presence of a valley circulation between the lower plain and the slopes and mountains that reverses its sense of circulation between day and night, which intensity varies in summer due to an increasing thermal contrast between irrigated and rain-fed areas. The presence of sea-breeze in the late afternoon in the warm months is common, bringing cooler and wetter marine air to the area after crossing the mountain range at the South. At night in the centre of the basin, cold air pools are formed, which evolve to persistent fog events in winter, causing the statistics to be very different in that season compared to the rest of the year.