

## ***Interactive comment on “Validation of a new SAFRAN-based gridded precipitation product for Spain and comparisons to Spain02 and ERA-Interim” by P. Quintana-Seguí et al.***

**Anonymous Referee #2**

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Summary: The paper presents a validation of a precipitation dataset for Spain meant potentially for hydrological and climatological simulations. The new generated dataset spanning more than four decades it is primarily of regional interest. Gridded precipitation data are important for hydro-climatological applications and its evaluation has to be appropriate.

The paper is well structured, the results are clearly presented but the methodology used for verification (Section 3.6) is not sufficiently described. As such, it gives the impression that it is suitable for continuous variables rather than for precipitation. To avoid misleading results for precipitation, the verification should be carried out such as the precipitation datasets used for verification, including rain gauge measurements,

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to represent the same spatial scales. I recommend publication once the authors have clarified these aspects and responded to the comments below.

Specific comments:

In order to improve the clarity of the paper, the authors might consider either to expand the acronyms before their first usage (as they have already done it in the first line of the Abstract) or to add an Appendix in which to list all the acronyms in the paper.

Section 1 Page 2, Line 15: Typo: e.g. -> to be removed.

Page 3, Line 33. ERA-Interim precipitation data come from pure low-resolution forecasts and this should be pointed out in the paper.

Section 2. Page 4, Line 14: After Koppen classification a reference is missing and should be introduced.

Section 3.1 Page 5, Line 2: Ritter and Geleyn (1992) developed a scheme for the parametrization of the radiative transfer in numerical weather prediction models. It should be better explained that SAFRAN uses this scheme to produce forecast fields for downward visible and infrared radiation.

Page 5, Line 8: How the climatically homogeneous zones are defined, particularly in areas where no rain gauge measurements are available as in the northeastern Spain (Fig.1b).

Page 5, Line 10: 'The zones have several vertical levels, spaced ...'. How many vertical levels are? Do all zones have the same number of vertical levels?

Page 5, Line 11: 'These values are subsequently horizontally interpolated to a regular grid ...'. Does it mean that each zone has its own regular grid? What is the value of the grid-mesh? In addition, how many grid points on a horizontal plane contains a zone? How many analysis points has SAFRAN across Spain? How the analysis horizontal points are defined or chosen?

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Page 5, Line 15: 'Afterwards, the data are time interpolated to the hourly scale using different methods for each variable...'. It should be described how accumulated daily precipitation is hourly disaggregated, particularly over the mountains when liquid and solid precipitation may occur during the same day.

Page 5, Line 16: '... SAFRAN uses as much data as possible ...'. How the observation quality control is performed in SAFRAN? For each grid point how many nearby observations are allowed to be used?

Page 5, Line 24: '... for which no first guess is used.' Optimal Interpolation do need a first guess, therefore if no first guess is used for precipitation analysis, what type of interpolation for rain gauge measurements employs SAFRAN? Please describe the precipitation analysis scheme used in SAFRAN.

Section 3.2 Page 6, Line 3: Which is the Spain02 AA-3D grid mesh value used?

Section 3.4 Page 6, Line 13: '... which start in September ... '. Also, it should be mentioned when the hydrological year ends?

Section 3.6 As I have already mentioned in the summary, this section should better describe the methodology used for verification. Unlike gauge measurements which are point observations, model precipitation represents the area of the model grid box, that is about 79 km times 79 km for ERA-Interim but not mentioned for SAFRAN. Comparisons between precipitation observation and the nearest grid point might provide misleading results.

Section 5. Page 10, Line 4 The term 'skill scores' to compare SAFRAN and Spain02 seems unsuitable as throughout the paper no skill scores have been shown. I suggest to use only 'scores' without reference to the skill, both in Conclusions and in the Abstract (page 1, Line 12).

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