

A Database of Optimal Integration Times for Lagrangian Studies of Atmospheric Moisture Sources and Sinks

Raquel Nieto (rnieto@uvigo.es) and Luis Gimeno (l.gimeno@uvigo.es)

Environmental Physics Laboratory | CIM-UVigo - Universidade de of Vigo
Campus As Lagoas, 32004 Ourense, Spain

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= Readme file | R. Nieto | Last update: 22/02/2021

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SHORT OVERVIEW:

Lagrangian methods for estimating sources and sinks of water vapour have increased in importance in recent years, with hundreds of publications over the past decade on this topic. Results derived from these approaches are, however, very sensitive to the integration time of the trajectories used in the analysis. The most widely used integration time is that derived from the average residence time of water vapour in the atmosphere, normally considered to be around 10 days.

In this database, we provide the **annual and monthly Optimal Integration Times (OPT)**, for a **spatial resolution of 0.25° x 0.25° in latitude and longitude** using data from the European Centre for Medium-Range Weather Forecasts (ECMWF) Interim Re-Analysis (ERA-Interim) for Lagrangian Studies of Atmospheric Moisture Sources and Sinks.

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Description of the Data Files:

Data format: NetCDF

File type: NetCDF-3/CDM

There are **2 types of files:**

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1) Those that **correspond to** the data described in: **R. Nieto, L. Gimeno (2019) A database of optimal integration times for Lagrangian studies of atmospheric moisture sources and sinks, Scientific Data 6, 1-10, <https://doi.org/10.1038/s41597-019-0068-8>**

There are **13 files**, one for the **annual OPT**, and 12 for **climatological monthly OPT**.

The files begin with a header name "OPT", followed by the number of the month ('OPT_MM.nc') or by "ANNUAL" for the climatology ('OPT_ANNUAL.nc').

Dimensions: Longitude = 1440 & Latitude = 720

Period: 1980-2015

Size: 2.1 MB

Variables:

Name	LongName	type	type	units	Range
longitude	longitude	1D	float	degrees	0 to 359.75
latitude	latitude	1D	float	degrees	90N to 89.75S
optimum	optimum	2D	short	days	longitude x latitude

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2) A widespread temporal coverage as it is required for some studies. This individual monthly dataset provides **optimal times month-by-month** for the longest period available.

There are **12 files** for **climatological monthly OPT**.

The files begin with a header name "OPT", followed by the number of the month (MM) and the period of study ('OPT_MM_1980-2018.nc').

Dimensions: Longitude = 1440 & Latitude = 720 & Time = 39
Period: January 1980 to December 2018
Size: 161.8 MB

Variables:

Name	LongName	type	type	units	Range
longitude	longitude	1D	float	degrees	0 to 359.75
latitude	latitude	1D	float	degrees	90N to 89.75S
time	time			1D	short year
1980 to 2018					
optimum	optimum	3D	float	days	longitude x latitude x time

notes: there are FillValues as NaNs (see comments on each NetCDF file)

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