

# Readme information for EuVeM2022

This folder contains EuVeM2022 in various reference frames (ETRF2000, ETRF2014, ITRF2014) as well as file formats (ascii, GMT grd, netCDF, shp, kmz). In addition, we provide the final velocity model grid for various countries in Europe (folder "country\_results").

## Folder structure

The folder structure is the following:

- "ascii"
  - contains all EuVeM2022 files as ascii files (.txt file format) with a header with detailed information
- "country\_results"
  - contains txt files with the final velocity model in the specific country as indicated by the name after the underscore (EuVeM2022\_"country name".txt)
  - contains figure files (png format) of the velocity model for various countries (naming: EuVeM2022\_"country name".png)
  - contains an additional readme file (readme\_country-results.txt) that explains the model shown in the figure files
- "filtered\_velocity\_field"
  - filtered velocity fields (estimation of the velocity at the observation points using least-squares collocation) and their differences to the observations
  - each file is for one component as indicated by the "E" for east-west, "N" for north-south and "U" for vertical/up
- "grd"
  - contains all EuVeM2022 files as grd files suitable for use in GMT (Generic Mapping Tools)
  - one grd file for each GNSS velocity component (EW, NS, UP) and the uncertainties (sEW, sNS, sUP) grouped in zip files for each EuVeM2022 model type
- "input\_velocity\_field"
  - input velocity fields based on EPND2150 used for the estimation of EuVeM2022
- "kmz"
  - contains kmz files suitable to use with Google Earth showing the vertical velocity grid as well as the horizontal velocity arrows on a 0.5 degree grid
- "netcdf"
  - contains all EuVeM2022 files as netCDF files (EW, NS, UP and their respective uncertainties are included in each netCDF file)
- "shp"
  - shape zip files for each EuVeM2022 model type (each zip file contains EW, NS, UP, sEW, sNS and sUP files)
- "strain"
  - resulting strain field based on EuVeM2022 as ascii, netCDF, grd, shp and kmz file
- "supplementary\_files"
  - high-resolution supplementary pdf files published as part of the model publication in Geophysical Journal International (<https://doi.org/10.1093/gji/ggaf052>)

## File naming

File naming ("model"\_"method"\_"frame") in "ascii", "grd", "kmz", "netcdf", "shp" and "strain":

Each file contains the model's name ("EuVeM2022"), the method used for interpolation ("HV-LSC-ex" (without moving variance) or "HV-LSC-ex2" (including moving variance)), and the reference frame ("ETRF2000", "ETRF2014", "ITRF2014"). Files that include two method names are the final chosen model results where HV-LSC-ex is used for the horizontal velocity model estimation and LSC-ex2 for the vertical velocity model estimation (e.g., "EuVeM2022\_HV-LSC-ex\_LSC-ex2\_ETRF2000").

## Citation

Please cite the dataset and an accompanying paper.

Paper citation:

Steffen, R., Steffen, H., Kenyeres, A., Nilsson, T., Lidberg, M. (2025): EuVeM2022 - A European 3D GNSS Velocity Model based on Least-Squares Collocation. Geophysical Journal International. doi: <https://doi.org/10.1093/gji/ggaf052>

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