Description of the SBAS DInSAR results of CNR-IREA

The LOS SBAS DInSAR time series are provided in files where the information is organized in an ASCII table.

The head of the ASCII Table, which is included between "####" notation, is relevant to the metadata, which contain general information on the exploited data. The field "Reference Point" represents the geographic coordinates of the point used as a reference for the processing, and it is always a point located in an area that can be considered stable. The last field of the metadata part, named "List_of_dates", represents the list of dates of the SAR acquisitions used for the interferometric

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####
DDSS_ID: LOS_DISPLACEMENT_TIMESERIES
Product_format: ASCII
Bounding_box: 44.815000 8.7255556 45.613889 10.309167
License: https://creativecommons.org/licenses/by/4.0
Software_version: CNR-IREA P-SBAS 30
Applied_algorithm_description: Parallel SBAS Interferometry Chain
Main_reference: 10.1109/JSTARS.2014.2322671, 10.1109/TGRS.2019.2904912
Date_of_measurement_start: 2015-03-23T17:14:27.179712Z
Date_of_measurement_end: 2022-10-24T17:15:16.770363Z
Geographic_CS_type_code: EPSG_4326
Used_DEM: SRTM_1arcsec
Super_master_SAR_image_ID:
S1A_IW_SLC__1SDV_20180106T171443_20180106T171510_020037_02223E_595E.SAFE
Spatial_resolution: 37, 37
Sensor: S1
Mode: IW
Antenna_side: Right
Relative_orbit_number: 15
Orbit_direction: ASCENDING
Wavelenght: 0.055465760
Value_unit: N/A, deg, deg, m, cm/yr, N/A, N/A, N/A, N/A, cm
Number_of_looks_azimuth: 2
Number_of_looks_range: 10
Applied_filter: Goldstein_0.50
Number_of_dates:  373
Reference_point: 14.588399 46.150242
Applied_corrections: No_Corrections
Time_Years:  2015.2316, 2015.2629, 2015.2958, 2015.3287, 2015.3627, 2015.3956,
2015.4269, 2015.4597, 2015.4926, 2015.5266, 2015.5595, 2015.5908, 2015.6237,
2015.6565, 2015.6878, 2015.7207, 2015.7547, 2015.7876, 2015.8205, 2015.8517, ...
List_of_Dates: 2015-03-23T17:14:27Z,2015-04-04T17:14:21Z,2015-04-16T17:14:22Z,2015-04-
28T17:14:13Z,2015-05-10T17:14:23Z,2015-05-22T17:14:24Z,2015-06-03T17:14:25Z,2015-06-
15T17:14:26Z,2015-06-27T17:14:26Z,2015-07-09T17:14:26Z,2015-07-21T17:14:27Z,....
Palette:  05
####
```

The actual results start from the second #### notation:

```
####
   ID,    Lat,     Lon, Topo,    Vel,    Coer,    cosN,     cosE,     cosU, TS

       0, 44.94569,   9.40903, 227.1900,  0.0602, 0.8750882, -0.1056252,-0.6030479,
0.7906811, 0.0000, -0.4499,  3.8617,  4.2410,  8.4562,  6.1018,  4.7021,  4.3272,
0.0698, -4.1987, -7.4788, -6.2446, -7.3567, -1.4003,  1.1312,  6.6955,  0.3961, -
1.5807, -3.6348, -2.0276, -2.0939, -0.5726,  0.5153,  2.4880,  1.8659, -0.2341,
0.0090,  0.2204,  2.3791,  0.0081,  0.1528,  1.1876, -0.3755,  3.9870,  5.8363,
3.4808,  1.7977,  3.1741,  1.3966,  0.6328, -0.0618,  ...

       1, 44.94597,   9.40708, 236.1900,  0.8568, 0.9169299, -0.1056180,-0.6029292,
0.7907725, 0.0000,  0.1528,  4.4151,  4.5966,  9.3971,  6.6749,  5.2058,  4.9440,
0.6007, -3.5229, -6.9988, -6.0578, -6.9934, -0.6201,  1.5418,  7.2927,  1.1647, -
1.0888, -3.0476, -1.5067, -1.5815, -0.1978,  1.1185,  3.0709,  2.4828,  0.2717,
0.3363,  0.5188,  2.6605,  0.0979,  0.4443,  1.6988, -0.0568,  4.1103,  6.1208,
3.6903,  2.0448,  3.3908,  1.4951,  0.4123,  0.0879,  ....

       2, 44.94597,   9.40736, 234.1900, -0.0101, 0.9802009, -0.1056191,-0.6029471,
0.7907588, 0.0000, -0.2456,  3.0608,  3.7564,  7.2779,  5.0996,  4.0939,  3.8730, -
0.0076, -3.5564, -6.3707, -5.9346, -6.1605, -0.7521,  0.6603,  4.8771,  0.5103, -
1.2418, -3.1392, -2.0832, -1.8171, -0.5720,  0.5396,  1.7948,  1.5160, -0.1359,
0.1232,  0.0201,  1.4940, -0.2497, -0.1434,  0.7292, -0.1066,  2.9777,  4.6173,
3.0074,  1.5205,  2.3841,  0.7882, -0.2581, -0.5859,  ...
```

The first line specifies the information relevant to the provided results, i.e., for each pixel that is considered reliable (coherent):

• **ID**: Unique pixel identifier;

• **Lat**: WGS84 Latitude in degree;

• **Lon**: WGS84 Longitude in degree;

• **Topo**: Topography above the ellipsoid in meters;

• **Vel**: Mean deformation velocity in cm/y, evaluated as linear regression of the displacement time series;

• **Coer**: Interferometric Temporal Coherence, a value between 0 and 1 that represents the reliability of the provided measurements;

• **cosN, cosE, cosU**: Components of LOS unit vector along the North, East and Vertical directions;

• **TS**: LOS displacement Time Series in cm; the length of this field depends on the number of SAR acquisitions used in the time series generation and listed in the above mentioned field named "List_of_dates"

Note that the provided results have been represented on the grid of the SRTM 1 arcsec Digital Elevation Model (DEM); accordingly, the geolocation accuracy corresponds to +/- half of pixel. The provided latitude and longitude are relevant to the center of the pixel of the considered DEM grid. Moreover, in order to minimize as much as possible decorrelation or noise effects, the provided measurements refer to pixels characterized by temporal coherence values greater than a selected threshold (typically 0.99). For each considered pixel, the first value of the displacement time series is 0.0000, because the first acquisition has been considered as the reference one.

It is worth noting that, regarding the SBAS DInSAR timeseries of the Vertical and the East-West component of the surface deformation, since they are obtained by properly combining the results relevant to the ascending and descending orbits, the head part of the ASCII table relevant to metadata will include only the appropriate applicable fields.