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MATLAB FUNCTIONS FOR CAMS RADIATION AND MCCLEAR SERVICES

CODE OVERVIEW

- 23/01/2019 -

*Edition 1.0*

# FOLDER HIERARCHY

The different codes are delivered within the following hierarchy:

matlab

common

cams

* common contains generic codes; the key ones are documented in this document;
* cams contains examples developed for the CAMS project.

# CODE DESCRIPTION

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| File name | common/cams\_radiation\_wget.m |
| Description | % Automatic retrieving of CAMS radiation values data from SoDa distant server |
| Example | % HC4 = cams\_radiation\_wget('myname@mydomain.com', [45.0 25.0], '2008-08-01', '2008-08-03', 15) |
| Inputs | % email\_address : suscribed email to SoDa, 'myname@mydomain.com'  % geopoint : [lat lon] or [lat lon elev]  % start\_date : start date, format 'YYYY-MM-DD'  % end\_date : end date, format 'YYYY-MM-DD'  % duration : 'd', 'h', 15 or 1  % verbose\_output : boolean to retrieve other information such as aerosols; only applicable to 'UT' and 1-min  % time : UT or TU or TST  % server : SoDa server. 'http://www.soda-is.com' (default) |
| Outputs | % HC4 : standard structure containing site information, period, irradiation (in Wh/m²), etc. |

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| File name | common/mcclear\_wget.m |
| Description | % Automatic retrieving of Broadband McClear values data from SoDa distant server |
| Example | % MC = mcclear\_wget('myname@mydomain.com', [45.0 25.0], '2008-08-01', '2008-08-03', 15) |
| Inputs | % email\_address : suscribed email to SoDa, 'myname@mydomain.com'  % geopoint : [lat lon] or [lat lon elev]  % start\_date : start date, format 'YYYY-MM-DD'  % end\_date : end date, format 'YYYY-MM-DD'  % duration : 'd', 'h', 15 or 1  % verbose\_output : boolean to retrieve other information such as aerosols; only applicable to 'UT' and 1-min  % time : UT or TU or TST  % server : SoDa server. 'http://www.soda-is.com' (default) |
| Outputs | % MC : standard structure containing site information, period, irradiation (in Wh/m²), etc. |

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| File name | common/util/statd\_irrad\_v6.m |
| Description | % Visual and statistical comparison of 2 time series |
| Example | % d = statd\_irrad\_v6(mG, mR, mCond, reg, graph\_scatter2, unit, labels) |
| Inputs | % mG : 1st time serie  % mR : 2nd time serie (reference)  % mCond : restriction matrix for the comparison; the size of mCond is the same as mG and mR, with 0 and 1  % reg : 1 to 5 for the regression type: '1 0', 'Regress[a,b]', 'Regress[a,0]', 'RobustFit[a,b]', 'PCA[a,b]'  % graph\_scatter2 : 1 or 0, 1 to display the graph  % unit : unit definition (none by default)  % labels : {ylabel xlabel} defines the axis label ('Estimation' and 'Reference' by default). |
| Outputs | % Statistical informations :  % n : number of data  % r : regression type  % mean\_ref : reference mean  % ve\_ref : reference variance  % std\_ref : reference standard deviation  % bias : mG bias (mean bias error) with respect to mR  % mae : mean absolute error  % stdev : standard deviation of the error  % rmse : root mean square error  % ...\_r : .../mean\_ref [%] (i.e. ... in pourcentage with respect to the reference mean)  % CC : correlation coefficient  % KSI : Kolmogov-Smirnov Integral test |

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| File name | common/util/irrad\_compare.m |
| Description | % Visual and statistical comparison of 2 to 8 time series |
| Example | % d = irrad\_compare(main\_title, date\_format, dates, title1, irrad1, title2, irrad2, title3, irrad3, plot\_irrad, stat\_irrad, mCond) |
| Inputs | % main\_title : graph title  % date\_format : date format for X-axis, e.g. 'mmmyy'  % dates : date vector; the size of dates is the same as the time series  % title1 : legend for the 1st time serie  % irrad1 : 1st time serie (matrix)  % varargin  % plot\_irrad : display graph if true (by default)  % stat\_irrad : computes statistical information if true (by default)  % mCond : restriction matrix for the comparison; the size of mCond is the same as time series, with 0 and 1 |
| Outputs | % Informations statistiques :  % NDATA : number of data  % TYPE.R : regression type  % MREF : reference mean  % MBE : mean bias error  % MAE : mean absolute error  % STDE : standard deviation of the error  % RMSE : root mean square error  % CC : correlation coefficient  % KSI : Kolmogov-Smirnov Integral test |