## Eddy Covariance Half-hourly files

| heading         Fc_wpl         CO2 flux, WPL corrected         mg m²s²s¹           LE_wpl         Latent heat flux, WPL corrected         W m²           Hs         Sensible heat flux         W m²           Tau         Shear stress         kg m¹s²²           U_star         Friction velocity         m s⁻¹           stdev_Uz         Standard deviation of vertical velocity         m s⁻¹           cov_Ux_Uz         Covariance of x and z wind components         m²s²²           cov_Uy_Uz         Covariance of CO₂ and vertical velocity         mg m²s²           cov_Uy_Uz         Covariance of CO₂ and vertical velocity         mg m²s²           cov_h2o_Uz         Covariance of H₂O and vertical velocity         K m s⁻¹           stdev_Ux         Standard deviation of x wind comp.         ms⁻¹           cov_toy_Ux_Uy         Cov of x and y wind comp.         m²s²¹           cov_Lx_Uy         Cov of x and y wind comp.         m²²s²¹           cov_Lx_Uy         Cov of x and y wind comp.         mg m²s²¹           cov_Lx_Uy         Covariance of H₂O and x wind comp.         mg m²s²¹           cov_Lx_Uy         Covariance of Sonic T and x wind comp.         ms s⁻¹           stdev_Uy         Standard deviation of y wind comp.         ms s⁻¹           cov_Ly_Uy </th <th>Column</th> <th>definition</th> <th>Units</th>   | Column        | definition   | Units                              |
|--|---------------|--|------------------------------------|
| FC_wpl   CO2 flux, WPL corrected   Mr m² s-1   |               |  |                                    |
| Hs Sensible heat flux Shear stress kg m¹s²²  U_star Friction velocity ms¹¹  Stodev_Uz Standard deviation of vertical velocity ms¹  cov_Ux_Uz Covariance of x and z wind components m²s²²  cov_Uy_Uz Covariance of y and z wind components m²s²²  cov_Co2_Uz Covariance of CO2 and vertical velocity mg m²s²¹  cov_H2O_Uz Covariance of H2O and vertical velocity gm²s²¹  cov_H2O_Uz Covariance of H2O and vertical velocity gm²s²¹  cov_Ts_Uz Cov. of sonic T and vertical velocity K ms¹¹  stdev_Ux Standard deviation of x wind comp. ms¹¹  cov_Ux_Uy Cov. of x and y wind comps. m²s²²  cov_co2_Ux Covariance of CO2 and x wind comp. mg m²s²¹  cov_L02_Ux Covariance of CO2 and x wind comp. mg m²s²¹  cov_L02_Ux Covariance of H2O and x wind comp. ms¹¹  stdev_Uy Covariance of Sonic T and x wind comp. ms¹¹  stdev_Uy Covariance of CO2 and y wind comp. ms¹¹  cov_Co2_Uy Covariance of CO2 and y wind comp. mg m²s²¹  cov_L02_Uy Covariance of H2O and y wind comp. mg m²s²¹  cov_L02_Uy Covariance of H2O and y wind comp. mg m²s²¹  cov_L02_Uy Covariance of Sonic T and y wind comp. mg m²s²¹  cov_L02_Uy Covariance of Sonic T and y wind comp. mg m²s²¹  cov_L02_Uy Covariance of Sonic T and y wind comp. mg m²s¹  stdev_co2 Standard deviation of CO2 conc. mg m³  stdev_h2O Standard deviation of H2O conc. mg m³  stdev_h2O Standard deviation of H2O conc. mg m³  stdev_h2O Standard deviation of H2O conc. ms¹¹  Uy_Avg Mean x wind component ms¹¹  Uy_Avg Mean y wind component ms¹¹  Uy_Avg Mean y wind component ms¹¹  co2_mean Mean CO2 concentration mg m³³  h2O_Avg Mean y wind component ms¹¹  co2_mean Mean Sonic Temperature C  wnd_dir_csa Compass wind direction CW deg. from N  wnd_dir_csa Compass wind direction CW deg. from N  wnd_dir_csat3 Wind direction with respect to sonic. +/- deg.  wnd_spd Mean windspeed ms¹¹  stt_wnd_spd Mean windspeed ms¹¹  stt_wnd_spd Mean windspeed ms¹¹  batt_volt_Avg Battery voltage  std_wnd_dir St. dev. of wind dir? Deg.  |               | CO2 flux, WPL corrected                              | mg m <sup>-2</sup> s <sup>-1</sup> |
| Tau Shear stress kg m-1s-2 U_star Friction velocity ms-1 stdev_Uz Standard deviation of vertical velocity ms-1 cov_Ux_Uz Covariance of x and z wind components m-2s-2 cov_Uy_Uz Covariance of OO2 and vertical velocity mg m-2s-1 cov_LO2 Covariance of H2O and vertical velocity gm-2s-1 cov_LO2 Uz Covariance of H2O and vertical velocity gm-2s-1 cov_LO2 Uz Covariance of H2O and vertical velocity gm-2s-1 cov_LO2 Uz Covariance of H2O and vertical velocity K ms-1 stdev_Ux Standard deviation of x wind comp. ms-1 cov_Ux_Uy Cov. of sonic T and vertical velocity K ms-1 stdev_Ux Standard deviation of x wind comp. mg-2s-2 cov_co2_Ux Covariance of CO2 and x wind comp. mg-2s-1 cov_LO2 Ux Covariance of CO2 and x wind comp. gm-2s-1 cov_LO2 Ux Covariance of H2O and x wind comp. mg-1 stdev_Uy Standard deviation of y wind comp. ms-1 stdev_Uy Standard deviation of y wind comp. mg-2s-1 cov_LO2 Uy Covariance of CO2 and y wind comp. mg-2s-1 cov_LO2 Uy Covariance of H2O and y wind comp. mg-2s-1 cov_LO2 Uy Covariance of H2O and y wind comp. mg m-2s-1 cov_LO2 Uy Covariance of H2O and y wind comp. mg m-3s-1 stdev_LO2 Standard deviation of CO2 conc. mg m-3 stdev_LO2 Standard deviation of H2O conc. gm-3 stdev_LO2 Standard deviation of H2O conc. gm-3 Ux_Avg Mean x wind component ms-1 Uy_Avg Mean x wind component ms-1 Uz_Avg Mean Banc CO2 concentration mg m-3 h2O_Avg Mean H2O concentration mg m-3 h2O_Avg Mean H2O concentration CC rho_a_mean Mean sonic Temperature Cho_a_mean Mean | LE_wpl        | Latent heat flux, WPL corrected                      | W m-2                              |
| U_star         Friction velocity         m s <sup>-1</sup> stdev_Uz         Standard deviation of vertical velocity         m s <sup>-1</sup> cov_Ux_Uz         Covariance of x and z wind components         m <sup>-2</sup> s <sup>-2</sup> cov_Uy_Uz         Covariance of V and z wind components         m <sup>-2</sup> s <sup>-2</sup> cov_co2_Uz         Covariance of CO <sub>2</sub> and vertical velocity         mg m <sup>-2</sup> s <sup>-1</sup> cov_h2o_Uz         Covariance of H <sub>2</sub> O and vertical velocity         K m s <sup>-1</sup> stdev_Ux         Standard deviation of x wind comp.         m s <sup>-1</sup> cov_Lx_Uy         Cov. of x and y wind comps.         m <sup>-2</sup> s <sup>-2</sup> cov_Lx_Uy         Cov of x and y wind comps.         mg m <sup>-2</sup> s <sup>-1</sup> cov_Lx_Uy         Covariance of CO <sub>2</sub> and x wind comp.         mg m <sup>-2</sup> s <sup>-1</sup> cov_Lx_Uy         Covariance of H <sub>2</sub> O and x wind comp.         ms m <sup>-1</sup> cov_Lx_Uy         Covariance of Sonic T and x wind comp.         ms s <sup>-1</sup> stdev_Uy         Standard deviation of y wind comp.         ms m <sup>-1</sup> cov_co2_Uy         Covariance of Sonic T and y wind comp.         ms m <sup>-2</sup> s <sup>-1</sup> cov_Ts_Uy         Covariance of Sonic T and y wind comp.         K m s <sup>-1</sup> stdev_bo_Uy         Covariance of Sonic T and y wind comp.         ms m <sup>-2</sup> s <sup>-1</sup> <  | Hs            | Sensible heat flux                                   | W m <sup>-2</sup>                  |
| stdev_Uz         Standard deviation of vertical velocity         m s-1           cov_Ux_Uz         Covariance of x and z wind components         m^2s^2           cov_Uy_Uz         Covariance of y and z wind components         m^2s^2           cov_co2_Uz         Covariance of H <sub>2</sub> O and vertical velocity         mg m^2s^1           cov_h2o_Uz         Covariance of H <sub>2</sub> O and vertical velocity         K m s-1           stdev_Ux         Standard deviation of x wind comp.         m s-1           cov_Ux_Uy         Cov. of x and y wind comps.         m^2s^2           cov_co2_Ux         Covariance of CO <sub>2</sub> and x wind comp.         mg m^2s^1           cov_h2o_Ux         Covariance of H <sub>2</sub> O and x wind comp.         mg m^2s^1           cov_h2o_Ux         Covariance of sonic T and x wind comp.         m s-1           stdev_Uy         Standard deviation of y wind comp.         m s-1           cov_h2o_Uy         Covariance of CO <sub>2</sub> and y wind comp.         m m m^2s^1           cov_h2o_Uy         Covariance of H <sub>2</sub> O and y wind comp.         g m^2s^1           cov_h2o_Uy         Covariance of Sonic T and y wind comp.         g m^2s^1           cov_h2o_Uy         Covariance of H <sub>2</sub> O and y wind comp.         g m^3           stdev_h2o         Standard deviation of CO <sub>2</sub> conc.         mg m^3           stdev_h2o   | Tau           | Shear stress   | kg m <sup>-1</sup> s <sup>-2</sup> |
| cov_Ux_Uz         Covariance of x and z wind components         m²s²²²           cov_Uy_Uz         Covariance of y and z wind components         m²s²²²           cov_co2_Uz         Covariance of CO₂ and vertical velocity         mg m²s³¹           cov_h2o_Uz         Covariance of H₂O and vertical velocity         K m s³¹           stdev_Ux         Standard deviation of x wind comp.         m s¹¹           cov_Ux_Uy         Cov. of x and y wind comps.         m²s²²²           cov_Lx_Uy         Cov. of x and y wind comps.         mg m²s²¹           cov_Lx_Uy         Covariance of CO₂ and x wind comp.         mg m²s²¹           cov_h2o_Ux         Covariance of H₂O and x wind comp.         g m²s²¹           cov_h2o_Ux         Covariance of sonic T and x wind comp.         ms ³¹           stdev_Uy         Standard deviation of y wind comp.         mg m²s²¹           cov_h2o_Uy         Covariance of Sonic T and y wind comp.         ms m³¹           cov_h2o_Uy         Covariance of sonic T and y wind comp.         g m²s²¹           cov_h2o_Uy         Covariance of Sonic T and y wind comp.         g m³³           stdev_co2         Standard deviation of H₂O conc.         mg m³³           stdev_h2o         Standard deviation of H₂O conc.         ms ³¹           Uy_Avg         Mean x wind component </td <td>U_star</td> <td>Friction velocity</td> <td>m s<sup>-1</sup></td>   | U_star        | Friction velocity                                    | m s <sup>-1</sup>                  |
| cov_Uy_Uz         Covariance of y and z wind components         m²s²²           cov_co2_Uz         Covariance of CO₂ and vertical velocity         mg m²s²¹           cov_h2o_Uz         Covariance of H₂O and vertical velocity         g m²s¹¹           cov_h2o_Uz         Cov. of sonic T and vertical velocity         K m s²¹           stdev_Ux         Standard deviation of x wind comp.         m s¹¹           cov_ux_Uy         Cov. of x and y wind comps.         m²s²²²           cov_co2_Ux         Covariance of CO₂ and x wind comp.         mg m²s²¹           cov_h2o_Ux         Covariance of Sonic T and x wind comp.         g m²s²¹           cov_h2o_Ux         Covariance of sonic T and x wind comp.         m s²¹           stdev_Uy         Standard deviation of y wind comp.         mg m²s¹           cov_co2_Uy         Covariance of Sonic T and y wind comp.         g m²s²¹           cov_h2o_Uy         Covariance of Sonic T and y wind comp.         k m s²¹           stdev_Loy         Standard deviation of CO₂ conc.         mg m³³           stdev_Loy         Standard deviation of H₂O conc.         g m³³           Ux_Avg         Mean x wind component         m s²¹           Uy_Avg         Mean y wind component         m s²¹           Uz_Avg         Mean y wind component         m s²¹  | stdev_Uz      | Standard deviation of vertical velocity              | m s <sup>-1</sup>                  |
| cov_co2_Uz         Covariance of CO2 and vertical velocity         mg m²s¹           cov_h2o_Uz         Covariance of H₂O and vertical velocity         K m s²¹           cov_Ts_Uz         Cov. of sonic T and vertical velocity         K m s²¹           stdev_Ux         Standard deviation of x wind comp.         m s²¹           cov_Ux_Uy         Cov. of x and y wind comps.         m²s²²²           cov_co2_Ux         Covariance of CO2 and x wind comp.         mg m²s²¹           cov_h2o_Ux         Covariance of Sonic T and x wind comp.         g m²s²¹           cov_h2o_Ux         Covariance of sonic T and x wind comp.         ms s¹           stdev_Uy         Standard deviation of y wind comp.         ms s¹           cov_co2_Uy         Covariance of Sonic T and y wind comp.         ms m²¹           cov_h2o_Uy         Covariance of Sonic T and y wind comp.         g m²s²¹           stdev_Duy         Covariance of Sonic T and y wind comp.         g m²³s¹           stdev_n2o         Standard deviation of CO2 conc.         mg m³³           stdev_h2o         Standard deviation of H2o conc.         g m³³           Ux_Avg         Mean x wind component         m s²¹           Uy_Avg         Mean y wind component         m s²¹           U2_Avg         Mean H2o concentration         g m³³   | cov_Ux_Uz     | Covariance of x and z wind components                | m-2s-2                             |
| cov_h2o_Uz         Covariance of H2O and vertical velocity         K m s <sup>-1</sup> cov_Ts_Uz         Cov. of sonic T and vertical velocity         K m s <sup>-1</sup> stdev_Ux         Standard deviation of x wind comp.         m s <sup>-1</sup> cov_Ux_Uy         Cov. of x and y wind comps.         m <sup>-2</sup> s <sup>-2</sup> cov_co2_Ux         Covariance of CO2 and x wind comp.         mg m <sup>-2</sup> s <sup>-1</sup> cov_h2o_Ux         Covariance of Sonic T and x wind comp.         K m s <sup>-1</sup> stdev_Uy         Standard deviation of y wind comp.         m s <sup>-1</sup> cov_co2_Uy         Covariance of CO2 and y wind comp.         m s <sup>-1</sup> cov_h2o_Uy         Covariance of Sonic T and y wind comp.         g m <sup>-2</sup> s <sup>-1</sup> cov_h2o_Uy         Covariance of Sonic T and y wind comp.         K m s <sup>-1</sup> stdev_co2         Standard deviation of CO2 conc.         mg m <sup>-3</sup> stdev_h2o         Standard deviation of H2O conc.         g m <sup>-3</sup> ux_Avg         Mean x wind component         m s <sup>-1</sup> uy_Avg         Mean y wind component         m s <sup>-1</sup> uz_Avg         Mean y wind component         m s <sup>-1</sup> uz_Avg         Mean H2O concentration         g m <sup>-3</sup> Ts_mean         Mean Bonic Temperature         C   | cov_Uy_Uz     | Covariance of y and z wind components                | m-2s-2                             |
| cov_Ts_UzCov. of sonic T and vertical velocityK m s-1stdev_UxStandard deviation of x wind comp.m s-1cov_Ux_UyCov. of x and y wind comps.m-2s-2cov_co2_UxCovariance of CO2 and x wind comp.mg m-2s-1cov_h2o_UxCovariance of H2O and x wind comp.K m s-1cov_Ts_UxCovariance of sonic T and x wind comp.K m s-1stdev_UyStandard deviation of y wind comp.mg m-2s-1cov_co2_UyCovariance of CO2 and y wind comp.g m-2s-1cov_h2o_UyCovariance of H2O and y wind comp.K m s-1stdev_co2Standard deviation of CO2 conc.mg m-3stdev_h2oStandard deviation of H2O conc.g m-3Ux_AvgMean x wind componentm s-1Uy_AvgMean y wind componentm s-1Uz_AvgMean z wind componentm s-1u2_AvgMean Z wind componentm g m-3h2o_AvgMean CO2 concentrationg m-3Ts_meanMean Sonic TemperatureCcho_a_meanMean sonic TemperatureCcho_a_meanMean air densitykg m-3press_meanMean barometric pressurekPapanel_tempDatalogger panel temperatureCwnd_dir,csaCompass wind directionCW deg. from Nwnd_spdMean windspeedm s-1std_wnd_spdMean resultant windspeedm s-1batt_volt_AvgBattery voltageVstd_wnd_dirSt. dev. of wind dir?Deg.   | cov_co2_Uz    | Covariance of CO <sub>2</sub> and vertical velocity  | mg m <sup>-2</sup> s <sup>-1</sup> |
| stdev_UxStandard deviation of x wind comp.m s-1cov_Ux_UyCov. of x and y wind comps.m-2s-2cov_co2_UxCovariance of CO2 and x wind comp.mg m-2s-1cov_h2o_UxCovariance of H2O and x wind comp.g m-2s-1cov_h2o_UxCovariance of sonic T and x wind comp.K m s-1stdev_UyStandard deviation of y wind comp.m s-1cov_co2_UyCovariance of CO2 and y wind comp.g m-2s-1cov_h2o_UyCovariance of H2O and y wind comp.K m s-1cov_h2o_UyCovariance of sonic T and y wind comp.K m s-1stdev_co2Standard deviation of CO2 conc.mg m-3stdev_h2oStandard deviation of H2O conc.g m-3Ux_AvgMean x wind componentm s-1Uy_AvgMean y wind componentm s-1Uz_AvgMean z wind componentm s-1co2_meanMean CO2 concentrationmg m-3h2o_AvgMean H2O concentrationg m-3h2o_AvgMean sonic TemperatureCcho_a_meanMean sonic TemperatureCfho_a_meanMean air densitykg m-3press_meanMean barometric pressurekPapanel_tempDatalogger panel temperatureCwnd_dir,csaCompass wind directionCW deg. from Nwnd_spdMean windspeedm s-1wnd_spdMean windspeedm s-1std_wnd_spdMean resultant windspeedm s-1batt_volt_AvgBattery voltageV   | cov_h2o_Uz    | Covariance of H <sub>2</sub> O and vertical velocity | g m <sup>-2</sup> s <sup>-1</sup>  |
| cov_Ux_UyCov. of x and y wind comps.m²-s²-²cov_co2_UxCovariance of CO2 and x wind comp.mg m²-s¹-¹cov_h2o_UxCovariance of H2O and x wind comp.g m²-s¹-¹cov_h2o_UxCovariance of sonic T and x wind comp.K m s¹-¹stdev_UyStandard deviation of y wind comp.m s¹-¹cov_co2_UyCovariance of CO2 and y wind comp.mg m²-2s¹-¹cov_h2o_UyCovariance of sonic T and y wind comp.g m²-2s¹-¹cov_h2o_UyCovariance of sonic T and y wind comp.K m s¹-¹stdev_co2Standard deviation of CO2 conc.mg m³-3stdev_h2oStandard deviation of H2O conc.g m³-3Ux_AvgMean x wind componentm s¹-¹Uy_AvgMean y wind componentm s¹-¹Uz_AvgMean z wind componentm s¹-¹co2_meanMean CO2 concentrationmg m³-3Ts_meanMean sonic TemperatureCrho_a_meanMean sonic TemperatureCrho_a_meanMean barometric pressurekPapanel_tempDatalogger panel temperatureCwnd_dir,csaCompass wind directionCW deg. from Nwnd_dir_csat3Wind direction with respect to sonic.+/- deg.wnd_spdMean windspeedm s¹-¹std_wnd_spdMean resultant windspeedm s¹-¹batt_volt_AvgBattery voltageVstd_wnd_dirSt. dev. of wind dir?Deg.n_TotNumber of data points in period  | cov_Ts_Uz     | Cov. of sonic T and vertical velocity                | K m s <sup>-1</sup>                |
| cov_co2_UxCovariance of CO2 and x wind comp.mg m-2s-1cov_h2o_UxCovariance of H2O and x wind comp.g m-2s-1cov_Ts_UxCovariance of sonic T and x wind comp.K m s-1stdev_UyStandard deviation of y wind comp.m s-1cov_co2_UyCovariance of CO2 and y wind comp.mg m-2s-1cov_h2o_UyCovariance of H2O and y wind comp.g m-2s-1cov_Ts_UyCovariance of sonic T and y wind comp.K m s-1stdev_co2Standard deviation of CO2 conc.mg m-3stdev_h2oStandard deviation of H2O conc.g m-3Ux_AvgMean x wind componentm s-1Uy_AvgMean y wind componentm s-1Uz_AvgMean z wind componentm g m-3to2_meanMean CO2 concentrationmg m-3h2o_AvgMean H2O concentrationg m-3Ts_meanMean sonic TemperatureCrho_a_meanMean air densitykg m-3press_meanMean barometric pressurekPapanel_tempDatalogger panel temperatureCwnd_dir,csaCompass wind directionCW deg. from Nwnd_dir_csat3Wind direction with respect to sonic.+/- deg.wnd_spdMean windspeedm s-1std_wnd_spdMean resultant windspeedm s-1std_wnd_dirSt. dev. of wind dir?Deg.n_TotNumber of data points in period  | stdev_Ux      | Standard deviation of x wind comp.                   | m s <sup>-1</sup>                  |
| cov_h2o_UxCovariance of H2O and x wind comp.g m-2s-1cov_Ts_UxCovariance of sonic T and x wind comp.K m s-1stdev_UyStandard deviation of y wind comp.m s-1cov_co2_UyCovariance of CO2 and y wind comp.mg m-2s-1cov_h2o_UyCovariance of H2O and y wind comp.g m-2s-1cov_h2o_UyCovariance of sonic T and y wind comp.K m s-1stdev_co2Standard deviation of CO2 conc.mg m-3stdev_h2oStandard deviation of H2O conc.g m-3Ux_AvgMean x wind componentm s-1Uy_AvgMean y wind componentm s-1Uz_AvgMean z wind componentm g m-3to2_meanMean CO2 concentrationmg m-3h2o_AvgMean H2O concentrationg m-3Ts_meanMean sonic TemperatureCrho_a_meanMean air densitykg m-3press_meanMean barometric pressurekPapanel_tempDatalogger panel temperatureCwnd_dir,csaCompass wind directionCW deg. from Nwnd_spdMean windspeedm s-1rslt_wnd_spdMean resultant windspeedm s-1batt_volt_AvgBattery voltageVstd_wnd_dirSt. dev. of wind dir?Deg.n_TotNumber of data points in period  | cov_Ux_Uy     | Cov. of x and y wind comps.                          | m-2s-2                             |
| cov_h2o_UxCovariance of H2O and x wind comp.g m-2s-1cov_Ts_UxCovariance of sonic T and x wind comp.K m s-1stdev_UyStandard deviation of y wind comp.m s-1cov_co2_UyCovariance of CO2 and y wind comp.mg m-2s-1cov_h2o_UyCovariance of H2O and y wind comp.g m-2s-1cov_h2o_UyCovariance of sonic T and y wind comp.K m s-1stdev_co2Standard deviation of CO2 conc.mg m-3stdev_h2oStandard deviation of H2O conc.g m-3Ux_AvgMean x wind componentm s-1Uy_AvgMean y wind componentm s-1Uz_AvgMean z wind componentm g m-3to2_meanMean CO2 concentrationmg m-3h2o_AvgMean H2O concentrationg m-3Ts_meanMean sonic TemperatureCrho_a_meanMean air densitykg m-3press_meanMean barometric pressurekPapanel_tempDatalogger panel temperatureCwnd_dir,csaCompass wind directionCW deg. from Nwnd_spdMean windspeedm s-1rslt_wnd_spdMean resultant windspeedm s-1batt_volt_AvgBattery voltageVstd_wnd_dirSt. dev. of wind dir?Deg.n_TotNumber of data points in period  | cov_co2_Ux    | Covariance of CO <sub>2</sub> and x wind comp.       | mg m <sup>-2</sup> s <sup>-1</sup> |
| cov_Ts_UxCovariance of sonic T and x wind comp.K m s-1stdev_UyStandard deviation of y wind comp.m s-1cov_co2_UyCovariance of CO2 and y wind comp.mg m-2s-1cov_h2o_UyCovariance of H2O and y wind comp.g m-2s-1cov_Ts_UyCovariance of sonic T and y wind comp.K m s-1stdev_co2Standard deviation of CO2 conc.mg m-3stdev_h2oStandard deviation of H2O conc.g m-3Ux_AvgMean x wind componentm s-1Uy_AvgMean y wind componentm s-1uz_AvgMean z wind componentm g m-3co2_meanMean CO2 concentrationmg m-3h2o_AvgMean H2O concentrationg m-3Ts_meanMean sonic TemperatureCrho_a_meanMean air densitykg m-3press_meanMean barometric pressurekPapanel_tempDatalogger panel temperatureCwnd_dir,csaCompass wind directionCW deg. from Nwnd_spdMean windspeedm s-1rslt_wnd_spdMean resultant windspeedm s-1std_wnd_dirSt. dev. of wind dir?Deg.n_TotNumber of data points in period  | cov_h2o_Ux    | Covariance of H <sub>2</sub> O and x wind comp.      |                                    |
| stdev_UyStandard deviation of y wind comp.m s-1cov_co2_UyCovariance of CO2 and y wind comp.mg m-2s-1cov_h2o_UyCovariance of H2O and y wind comp.g m-2s-1cov_Ts_UyCovariance of sonic T and y wind comp.K m s-1stdev_co2Standard deviation of CO2 conc.mg m-3stdev_h2oStandard deviation of H2O conc.g m-3Ux_AvgMean x wind componentm s-1Uy_AvgMean y wind componentm s-1Uz_AvgMean z wind componentm g m-3h2o_AvgMean CO2 concentrationmg m-3Ts_meanMean sonic TemperatureCfho_a_meanMean air densitykg m-3press_meanMean barometric pressurekPapanel_tempDatalogger panel temperatureCwnd_dir,csaCompass wind directionCW deg. from Nwnd_dir_csat3Wind direction with respect to sonic.+/- deg.wnd_spdMean windspeedm s-1rslt_wnd_spdMean resultant windspeedm s-1batt_volt_AvgBattery voltageVstd_wnd_dirSt. dev. of wind dir?Deg.n_TotNumber of data points in period  | cov Ts Ux     | Covariance of sonic T and x wind comp.               |                                    |
| cov_co2_UyCovariance of CO2 and y wind comp.mg m-2s-1cov_h2o_UyCovariance of H2O and y wind comp.g m-2s-1cov_Ts_UyCovariance of sonic T and y wind comp.K m s-1stdev_co2Standard deviation of CO2 conc.mg m-3stdev_h2oStandard deviation of H2O conc.g m-3Ux_AvgMean x wind componentm s-1Uy_AvgMean y wind componentm s-1Uz_AvgMean z wind componentmg m-3h2o_AvgMean H2O concentrationg m-3Ts_meanMean sonic TemperatureCfho_a_meanMean barometric pressurekg m-3press_meanMean barometric pressurekPapanel_tempDatalogger panel temperatureCwnd_dir,csaCompass wind directionCW deg. from Nwnd_dir_csat3Wind direction with respect to sonic.+/- deg.wnd_spdMean windspeedm s-1rslt_wnd_spdMean resultant windspeedm s-1batt_volt_AvgBattery voltageVstd_wnd_dirSt. dev. of wind dir?Deg.n_TotNumber of data points in period   |               | Standard deviation of y wind comp.                   |                                    |
| cov_h2o_UyCovariance of H2O and y wind comp.g m-2s-1cov_Ts_UyCovariance of sonic T and y wind comp.K m s-1stdev_co2Standard deviation of CO2 conc.mg m-3stdev_h2oStandard deviation of H2O conc.g m-3Ux_AvgMean x wind componentm s-1Uy_AvgMean y wind componentm s-1Uz_AvgMean z wind componentmg m-3to2_meanMean CO2 concentrationmg m-3h2o_AvgMean H2O concentrationg m-3Ts_meanMean sonic TemperatureCfho_a_meanMean air densitykg m-3press_meanMean barometric pressurekPapanel_tempDatalogger panel temperatureCwnd_dir,csaCompass wind directionCW deg. from Nwnd_dir_csat3Wind direction with respect to sonic.+/- deg.wnd_spdMean windspeedm s-1rslt_wnd_spdMean resultant windspeedm s-1bat_volt_AvgBattery voltageVstd_wnd_dirSt. dev. of wind dir?Deg.n_TotNumber of data points in period   | <u> </u>      | Covariance of $CO_2$ and y wind comp.                | mg m <sup>-2</sup> s <sup>-1</sup> |
| cov_Ts_UyCovariance of sonic T and y wind comp.K m s-1stdev_co2Standard deviation of CO2 conc.mg m-3stdev_h2oStandard deviation of H2O conc.g m-3Ux_AvgMean x wind componentm s-1Uy_AvgMean y wind componentm s-1Uz_AvgMean z wind componentm s-1co2_meanMean CO2 concentrationmg m-3h2o_AvgMean H2O concentrationg m-3Ts_meanMean sonic TemperatureCrho_a_meanMean air densitykg m-3press_meanMean barometric pressurekPapanel_tempDatalogger panel temperatureCwnd_dir,csaCompass wind directionCW deg. from Nwnd_dir_csat3Wind direction with respect to sonic.+/- deg.wnd_spdMean windspeedm s-1rslt_wnd_spdMean resultant windspeedm s-1batt_volt_AvgBattery voltageVstd_wnd_dirSt. dev. of wind dir?Deg.n_TotNumber of data points in period   | cov h2o Uy    |  |                                    |
| stdev_co2Standard deviation of CO2 conc.mg m-3stdev_h2oStandard deviation of H2O conc.g m-3Ux_AvgMean x wind componentm s-1Uy_AvgMean y wind componentm s-1Uz_AvgMean z wind componentm s m s-1co2_meanMean CO2 concentrationmg m-3h2o_AvgMean H2O concentrationg m-3Ts_meanMean sonic TemperatureCrho_a_meanMean air densitykg m-3press_meanMean barometric pressurekPapanel_tempDatalogger panel temperatureCwnd_dir_csaCompass wind directionCW deg. from Nwnd_dir_csat3Wind direction with respect to sonic.+/- deg.wnd_spdMean windspeedm s-1rslt_wnd_spdMean resultant windspeedm s-1batt_volt_AvgBattery voltageVstd_wnd_dirSt. dev. of wind dir?Deg.n_TotNumber of data points in period   |               |  |                                    |
| stdev_h2oStandard deviation of H2O conc.g m-3Ux_AvgMean x wind componentm s-1Uy_AvgMean y wind componentm s-1Uz_AvgMean z wind componentm s-1co2_meanMean CO2 concentrationmg m-3h2o_AvgMean H2O concentrationg m-3Ts_meanMean sonic TemperatureCrho_a_meanMean air densitykg m-3press_meanMean barometric pressurekPapanel_tempDatalogger panel temperatureCwnd_dir,csaCompass wind directionCW deg. from Nwnd_dir_csat3Wind direction with respect to sonic.+/- deg.wnd_spdMean windspeedm s-1rslt_wnd_spdMean resultant windspeedm s-1batt_volt_AvgBattery voltageVstd_wnd_dirSt. dev. of wind dir?Deg.n_TotNumber of data points in period   | stdev co2     |  | mg m <sup>-3</sup>                 |
| Ux_AvgMean x wind componentm s-1Uy_AvgMean y wind componentm s-1Uz_AvgMean z wind componentm s-1co2_meanMean CO2 concentrationmg m-3h2o_AvgMean H2O concentrationg m-3Ts_meanMean sonic TemperatureCrho_a_meanMean air densitykg m-3press_meanMean barometric pressurekPapanel_tempDatalogger panel temperatureCwnd_dir,csaCompass wind directionCW deg. from Nwnd_dir_csat3Wind direction with respect to sonic.+/- deg.wnd_spdMean windspeedm s-1rslt_wnd_spdMean resultant windspeedm s-1batt_volt_AvgBattery voltageVstd_wnd_dirSt. dev. of wind dir?Deg.n_TotNumber of data points in period  | _             |  |                                    |
| Uy_AvgMean y wind componentm s-1Uz_AvgMean z wind componentm s-1co2_meanMean CO2 concentrationmg m-3h2o_AvgMean H2O concentrationg m-3Ts_meanMean sonic TemperatureCrho_a_meanMean air densitykg m-3press_meanMean barometric pressurekPapanel_tempDatalogger panel temperatureCwnd_dir,csaCompass wind directionCW deg. from Nwnd_dir_csat3Wind direction with respect to sonic.+/- deg.wnd_spdMean windspeedm s-1rslt_wnd_spdMean resultant windspeedm s-1batt_volt_AvgBattery voltageVstd_wnd_dirSt. dev. of wind dir?Deg.n_TotNumber of data points in period  | Ux Avg        |  |                                    |
| Uz_Avg Mean z wind component m s-1 co2_mean Mean CO2 concentration mg m-3 h2o_Avg Mean H2O concentration g m-3 Ts_mean Mean sonic Temperature C rho_a_mean Mean air density kpa press_mean Mean barometric pressure kPa panel_temp Datalogger panel temperature C wnd_dir,csa Compass wind direction CW deg. from N wnd_dir_csat3 Wind direction with respect to sonic. +/- deg. wnd_spd Mean windspeed m s-1 rslt_wnd_spd Mean resultant windspeed m s-1 batt_volt_Avg Battery voltage V std_wnd_dir St. dev. of wind dir? Deg. n_Tot Number of data points in period   |               | -  | m s <sup>-1</sup>                  |
| co2_meanMean CO2 concentrationmg m-3h2o_AvgMean H2O concentrationg m-3Ts_meanMean sonic TemperatureCrho_a_meanMean air densitykg m-3press_meanMean barometric pressurekPapanel_tempDatalogger panel temperatureCwnd_dir,csaCompass wind directionCW deg. from Nwnd_spdWind direction with respect to sonic.+/- deg.wnd_spdMean windspeedm s-1rslt_wnd_spdMean resultant windspeedm s-1batt_volt_AvgBattery voltageVstd_wnd_dirSt. dev. of wind dir?Deg.n_TotNumber of data points in period  |               | 1  | m s <sup>-1</sup>                  |
| h2o_AvgMean H2O concentrationg m-3Ts_meanMean sonic TemperatureCrho_a_meanMean air densitykg m-3press_meanMean barometric pressurekPapanel_tempDatalogger panel temperatureCwnd_dir,csaCompass wind directionCW deg. from Nwnd_dir_csat3Wind direction with respect to sonic.+/- deg.wnd_spdMean windspeedm s-1rslt_wnd_spdMean resultant windspeedm s-1batt_volt_AvgBattery voltageVstd_wnd_dirSt. dev. of wind dir?Deg.n_TotNumber of data points in period  |               | •  | mg m <sup>-3</sup>                 |
| Ts_meanMean sonic TemperatureCrho_a_meanMean air densitykg m-3press_meanMean barometric pressurekPapanel_tempDatalogger panel temperatureCwnd_dir,csaCompass wind directionCW deg. from Nwnd_dir_csat3Wind direction with respect to sonic.+/- deg.wnd_spdMean windspeedm s-1rslt_wnd_spdMean resultant windspeedm s-1batt_volt_AvgBattery voltageVstd_wnd_dirSt. dev. of wind dir?Deg.n_TotNumber of data points in period  | h2o Avg       | Mean H <sub>2</sub> O concentration                  |                                    |
| rho_a_meanMean air densitykg m-3press_meanMean barometric pressurekPapanel_tempDatalogger panel temperatureCwnd_dir,csaCompass wind directionCW deg. from Nwnd_dir_csat3Wind direction with respect to sonic.+/- deg.wnd_spdMean windspeedm s-1rslt_wnd_spdMean resultant windspeedm s-1batt_volt_AvgBattery voltageVstd_wnd_dirSt. dev. of wind dir?Deg.n_TotNumber of data points in period  |               |  |                                    |
| press_meanMean barometric pressurekPapanel_tempDatalogger panel temperatureCwnd_dir,csaCompass wind directionCW deg. from Nwnd_dir_csat3Wind direction with respect to sonic.+/- deg.wnd_spdMean windspeedm s-1rslt_wnd_spdMean resultant windspeedm s-1batt_volt_AvgBattery voltageVstd_wnd_dirSt. dev. of wind dir?Deg.n_TotNumber of data points in period  | _             |  | kg m <sup>-3</sup>                 |
| panel_temp Datalogger panel temperature C  wnd_dir,csa Compass wind direction CW deg. from N  wnd_dir_csat3 Wind direction with respect to sonic. +/- deg.  wnd_spd Mean windspeed ms-1  rslt_wnd_spd Mean resultant windspeed ms-1  batt_volt_Avg Battery voltage V  std_wnd_dir St. dev. of wind dir? Deg.  n_Tot Number of data points in period  | press mean    |  |                                    |
| wnd_dir,csaCompass wind directionCW deg. from Nwnd_dir_csat3Wind direction with respect to sonic.+/- deg.wnd_spdMean windspeedm s-1rslt_wnd_spdMean resultant windspeedm s-1batt_volt_AvgBattery voltageVstd_wnd_dirSt. dev. of wind dir?Deg.n_TotNumber of data points in period  | · –           | ^  | С                                  |
| wnd_dir_csat3Wind direction with respect to sonic.+/- deg.wnd_spdMean windspeedm s-1rslt_wnd_spdMean resultant windspeedm s-1batt_volt_AvgBattery voltageVstd_wnd_dirSt. dev. of wind dir?Deg.n_TotNumber of data points in period   |               |  | CW deg. from N                     |
| wnd_spdMean windspeedm s-1rslt_wnd_spdMean resultant windspeedm s-1batt_volt_AvgBattery voltageVstd_wnd_dirSt. dev. of wind dir?Deg.n_TotNumber of data points in period   |               |  |                                    |
| rslt_wnd_spd Mean resultant windspeed m s-1 batt_volt_Avg Battery voltage V std_wnd_dir St. dev. of wind dir? Deg. n_Tot Number of data points in period   |               |  | 1                                  |
| batt_volt_AvgBattery voltageVstd_wnd_dirSt. dev. of wind dir?Deg.n_TotNumber of data points in period  |               | *  |                                    |
| std_wnd_dirSt. dev. of wind dir?Deg.n_TotNumber of data points in period   |               | •  |                                    |
| n_Tot Number of data points in period  |               |  |                                    |
|  |               |  | - 0                                |
|  | csat warnings | Number of csat warning flags                         |                                    |

| irga_warnings  |                                       |                                    |
|----------------|---------------------------------------|------------------------------------|
| irga warnings  | Number of irga warnings               |                                    |
| sig_lck_f_Tot  | See Licor manual for flag definitions |                                    |
| amp_h_f_Tot    | и                                     |                                    |
| amp_l_f_Tot    | и                                     |                                    |
| chopper_f_Tot  | и                                     |                                    |
| detector_f_Tot | и                                     |                                    |
| pll_f_Tot      | и                                     |                                    |
| pll_f_Tot      | u                                     |                                    |
| sync_f_Tot     | и                                     |                                    |
| agc_Avg        | Irga gain control                     |                                    |
| Fc_irga        | Raw CO2 flux                          | mg m <sup>-2</sup> s <sup>-1</sup> |
| LE_irga        | Raw H2O flux                          | g m <sup>-2</sup> s <sup>-1</sup>  |
| co2_wpl_LE     | CO2 WPL correction for LE             | mg m <sup>-2</sup> s <sup>-1</sup> |
| co2_wpl_H      | CO2 WPL correction for H              | mg m <sup>-2</sup> s <sup>-1</sup> |
| h2o_wpl_LE     | H20 WPL correction for LE             | g m <sup>-2</sup> s <sup>-1</sup>  |
| h2o_wpl_H      | H20 WPL correction for H              | g m <sup>-2</sup> s <sup>-1</sup>  |