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CO_2 emissions driven by wind are produced at global scale

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As an important tool for understanding and monitoring ecosystem dynamics at ecosystem level, the eddy covariance (*EC*) technique allows the assessment of the diurnal and seasonal variation of the net ecosystem exchange (*NEE*). Despite the high temporal resolution data, there are still many processes (in addition to photosynthesis and respiration) that, although they are being monitored, have been neglected. Only a few authors have studied anomalous CO_2 emissions (non biological), and have related them to soil ventilation, photodegradation or geochemical processes. The aims of this study are: 1) to identify anomalous daytime CO_2 emissions in different ecosystems distributed around the world, 2) to determine the meteorological variables that influence these emissions, and 3) to explore the potential processes which can be involved. We have studied *EC* data together with other meteorological ancillary variables obtained from the FLUXNET database and have found more than 50 sites with anomalous CO_2 emissions in different ecosystem types such as grasslands, croplands or savannas. Data were filtered according to the FLUXNET quality control flags (only data with maximum quality were used, i.e. control flag equal to 0) and daytime (shortwave radiation incoming > 50 W m^{-2}). Partial Spearman correlation analyses were performed between *NEE* and ancillary data: air temperature, vapour pressure deficit, soil temperature, precipitation, atmospheric pressure, soil water content, incoming photosynthetic photon flux density, friction velocity and net radiation. When necessary, ancillary variables were gap-filled using the MDS method (Reichstein et al. 2005).

Preliminary results showed strong and highly significant correlations between friction velocity and anomalous CO_2 emissions, suggesting that these emissions were mainly produced by ventilation events. Anomalous CO_2 emissions were found mainly in arid ecosystems and sites with hot and dry summers. We suggest that anomalous CO_2 emissions occur globally and therefore, their contribution to the global *NEE* requires further investigation in order to better understand its drivers.