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Quality control on eddy covariance diurnal fluxes of energy and carbon dioxide on a mountain slope

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Eddy covariance data were collected at a station located on a slope characterised by a very common and increasing land cover in the Alpine region, that is, the abandoned pasture. Three diurnal growing season (2014, 2016 and 2017) were considered. The site is located at 1730 m asl in Cogne (Valle d'Aosta, Italy). The sensible and latent heat fluxes, as well as the carbon dioxide flux, were estimated. The in-situ fluxes and their quality were examined to assess whether an acceptable amount of good quality data was collected, and then proposing a simple step by step quality control procedure. Finally, the assessment on the typical daily cycle was computed. The results suggest that there is a relatively high amount of reliable data (82.3%, 82.5% and 72.2% for the three explored fluxes, namely the sensible and latent heat and the carbon dioxide fluxes, after all the quality control). The eddy covariance technique gives a rather acceptable performance in the evaluation of daytime fluxes and especially in evaluating the cumulative fluxes for energy and CO₂. In fact, the data are of better quality when the fluxes are higher, while the lower quality is found usually when the fluxes are weak. Finally, another information on the reliability of the evaluated fluxes is given by the energy balance closure computation, which yields, using the energy balance ratio method, an overall value of 0.69.