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Analysis of periods with strong and coherent CO₂ advection over a forested hill

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Horizontală andă verticală advectiveă uxesă ofă CO₂ measuredă duringă theă CarboEurope-IPă advectionexperiment (ADVEX) at the Wetzstein spruce forest site in Thuringia, Germany, were related to winddirection, stratification regime and friction velocity u^* . Measurements of wind speed and direction-carried out at one of the slopes of the ridge revealed the existence of reverse ow below the canopy onthe downwind side. This uphill ow occurred concurrently with the advective uxes measured at the topof the hill. Such result is in agreement with recent modeling works that support the existence ofadvection at low hills covered with a canopy. Another experimental evidence that suggest a link betweenadvection at this site with the ow over the hill came from the analysis of the horizontal gradient of CO₂inside the volumeă formed by the ADVEX towers. It was observed that CO₂ accumulatedă near thedownwind side of the crest for cross-ridge ows, what is consistent with another modeling work of thetransport of scalars across a low hill covered with a canopy.

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