



Can advection of sensible heat serve as an indicator for advection of carbon dioxide?

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The advection experiments ADVEX (year 2005 and 2006) conducted by an initiative of CarboEurope-IP shared all the same geometry and set-up and provide data for three coniferous sites across Europe. These data form the basis for the calculation of advective fluxes of sensible heat and carbon dioxide using the same method exactly. The behaviour of the two advective fluxes was analyzed in relation to wind direction, friction velocity and atmospheric stability separately for night and day. A quite clear pattern was found, i.e. both fluxes were of opposite sign and also their variations in magnitude were comparable in relation to the inspected variables. This was quite surprising considering the different sources and sinks of both fluxes. However, it turned out that a clear relationship is probably favoured by topography (at least some slope) and a predominant wind system at the respective site. Additionally, consistent patterns developed more clearly during nighttime when advection is more important. It is concluded that use of advective fluxes of sensible heat as an indicator for advection of CO₂ is a promising approach at complex sites with a distinct wind system.