

Revisiting the boundary layer structure used in Craig and Gordon's model of isotopic fractionation in evaporation

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Craig and Gordon's (CG) model of isotope fractionation in evaporation was derived more than 40 years ago and was based on the turbulent boundary layer structure model acceptable at that time. That view suggested that turbulent flows consist of eddies with a wide range of length scales moving randomly in the flow domain. There is evidence that some parameters in CG model do not fully correspond to data in the literature. Owing to advances in fluid dynamics research techniques, it has been shown in recent decades that the apparent chaotic flow in turbulent boundary layers is in fact governed by few well-organised structures. This article reviews the major characteristics of these coherent structures based on available results from experimental, numerical and theoretical studies of turbulent and laminar boundary layers. The review points on some differences between past and present views of the boundary layer structure and on their relation and possible influence on power laws in CG model