



Estimating the Evaporation from Irrigation Canals in Northwestern China Using the Double-Deck Surface Air Layer Model

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The evaporation from irrigation canals was estimated by the aerodynamic method based on the double-deck surface air layer model (called “DSAL model” for short hereafter). The DSAL model describes the surface air layer over a canal as a composite air layer with two sublayers, the lower sublayer and the upper sublayer. The lower sublayer is a few tens of centimetres thick and formed by the flowing water, in which there is no advection; the upper sublayer is over the lower sublayer and formed by the surface wind. The results were compared to those obtained by the heat balance method; field experiments were conducted in the middle reaches of the Heihe River in north western China. Results showed that cumulative evaporation instances estimated by the DSAL model were equal in order of magnitude to those by the heat balance method on observed days during the daytime (0700~1900BST). We infer from these experimental results that the evaporation loss in transport in this region is of the order of one percent at most.