



Similarity theory and calculation of turbulent fluxes at the surface for the stably stratified atmospheric boundary layers

S. Zilitinkevich (1,2,3) and I. Esau (2)

(1) Division of Atmospheric Sciences, University of Helsinki, Finland, (2) Nansen Environmental and Remote Sensing Centre / Bjerknæs Centre for Climate Research, Bergen, Norway, (3) Finnish Meteorological Institute, Helsinki, Finland

In this paper we revise the similarity theory for the stably stratified atmospheric boundary layer (ABL), formulate analytical approximations for the wind velocity and potential temperature profiles over the entire ABL, validate them against large-eddy simulation and observational data, and develop an improved surface flux calculation technique for use in operational models.