Geophysical Research Abstracts
Vol. 16, EGU2014-1938, 2014
EGU General Assembly 2014

A simple model of tornado-like vortices

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Based on similarity assumptions and integral technique borrowed from basic fluid dynamics, a simple model of steady tornado-like vortices has been developed which relates the maximum azimuthal velocity in the end-wall vortex adjacent to the ground surface to the amount of convective available potential energy (CAPE) accumulated in pre-tornadic conditions in the environmental atmosphere. By using Bayes' theorem the relative conditional probabilities for tornado occurrence – given the environmental CAPE-values – are estimated based on the knowledge of an unconditional CAPE-distribution in the atmosphere and also of the tornado intensity distribution.