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**Model Development**
Discussions

# *Interactive comment on* "An improved non-iterative surface layer flux scheme for atmospheric stable stratification condition" *by* Y. Li et al.

**Anonymous Referee #1**

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GENERAL COMMENT

The authors present an algorithm to compute the stability parameter and the transfer coefficients in stable situations without the necessity to iterate. The method reduces the error of a recently proposed method (WRL12). I didn't go through the mathematical derivation of the equations but from the results provided the method seems to improve the accuracy of WRL12's method. This was the major goal of the work so I would recommend the paper for publication subjected to some minor comments provided below.

A general comment that I would like to raise for discussion is whether we need such

a complexity in our geophysical models to calculate the stability parameter and the transfer coefficients. The method proposed by WRL12 has already a large number of equations. The present one introduces a large number of parameters to fit the equations in the different regions (Table 2-8). Is this level of accuracy/complexity necessary given the large number of approximations that are already in our model's formulations? Any discussion in this direction would be desirable in the manuscript.

MINOR COMMENTS

1. It is not clear if the method only works for the stability range $0 < Ri < 2.5$. If so this should be discussed since under stable conditions the winds are weak and often $Ri$ is higher than 2.5.

2. It would be a good idea to describe a bit better the figures when they are presented in the text.

3. Adding a figure or sketch to clarify how the different regions are defined would make it easier to understand the method.

Interactive comment on Geosci. Model Dev. Discuss., 6, 6459, 2013.