

A New Basic 1-Dimension 1-Layer Model Obtains Excellent Agreement With the Observed Earth Temperature

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Abstract:

The Earth radiation and energy budget is calculated by a manifold of rather complex Global Circulation Models. Their outcome mostly cannot identify radiation in the atmosphere or energy budget relations. Therefore it is reasonable to look at more basic models to identify the main aspects of the model results. The simplest one of all of those is a 1-dimensional 1-layer model. However, most of these models – two are discussed here – suffer the drawback that they do not include essential contributions and relations between the atmospheric layer and the Earth. The 1-dimensional 1-layer model presented here integrates sensible and latent heat, the absorption of solar radiation in the atmosphere and the direct emission of the long wave radiation to space in addition to the standard correlations. For the atmospheric layer two different long wave fluxes are included, top of atmosphere to space and bulk emission to Earth. The reflections of long wave radiations are taken into account. It is shown that this basic model is in excellent agreement with the observed integrated global energy budget.