

## ***Interactive comment on “Matching the Turc–Budyko functions with the complementary evaporation relationship: consequences for the drying power of the air and the Priestley–Taylor coefficient” by J.-P. Lhomme and R. Moussa***

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This paper aims to relate the complementary relationship and the Budyko framework. It is very interesting, and may be useful for the understanding of evaporation estimation. However, some improvements are required. I am having some comments below.

1. Different definitions of "potential evaporation" need distinguishing. First: in the Budyko framework, " potential evaporation " is defined as energy supply for evaporation, which is estimated by solar radiation, Penman equation, or Priestley-Taylor equation. They were used in same equations without distinguishing their differences. So, the question is, why Penman evaporation is used in Eq. (1), and denoting Priestley-

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Taylor evaporation indirectly through the complementary relationship?

2 Why using Priestley-Taylor equation by Eq. (3) and (7)? What is the difference? Please give more explanations.

3. What is the purpose or significance of the work? Improving evaporation estimation? Help to determine the Priestley-Taylor coefficient?

4. Some generalized complementary relationship (Brutsaert, 2015, Han et al., 2012) were proposed in recent publications. However, the advection-aridity model of Brutsaert (1979) is used to denote the complementary relationship model in this paper. As a result, the linking proposed in this paper may be not generalized.

5. In section 3, the drying power of the air is used, and the psychrometric constant and the slope of the saturated vapor pressure curve at air temperature have to be taken as variables. If using the aerodynamic term instead, the relationship may be more clear.

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