



MEP climate, horizontal and vertical material entropy production in a simple two-dimensional model

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A simple model of climate with prescribed longwave transmissivities and shortwave heating rates is studied in order to investigate the material entropy production (EP) as a function of the temperature field. Significant temperature fields are considered to quantify how much of the material entropy production is associated with vertical and horizontal large-scale motion. It turns out that approximately 90 % of the EP is associated with vertical processes and 10 % with horizontal large scale motions. The MEP (Maximum Entropy Production) solution shows surprising realism as far as the horizontal large scale organisation of the climate is concerned whereas the vertical structure looks to be much less realistic. Finally a more general problem is investigated in which also the longwave transmissivity is varied simultaneously with the temperature. This leads to a MEP solution which is far more unrealistic than the one previously found.