Hydrol. Earth Syst. Sci. Discuss., 8, C2343–C2345, 2011
www.hydrol-earth-syst-sci-discuss.net/8/C2343/2011/

Hydrology and Earth System Sciences Discussions

Interactive comment on "Scaling and trends of hourly precipitation extremes in two different climate zones – Hong Kong and the Netherlands" *by* G. Lenderink et al.

G. Lenderink

lenderin@knmi.nl

Received and published: 22 June 2011

Dear Dr. Allan

Thank you very much for your comments. Here, we would like to comment on point 2. We investigated a possible dependency on the relative humidity by making subselections of the data for NL. First, the hourly data has been divided into three classes: those with T-Tdew less than 3 degree, with T-Tdew between 3 and 6 degrees, and finally between 6 and 9 degrees. The last class represent situations with a low relative humidity, whereas the first class represents situations with a high relative humidity.

From these three different selections, we re-computed the extremes statistics dependent on the dew point temperature as in Figure 2. For each percentile we have now three estimates corresponding to relatively low, average, and high relative humidity. For reference, we also plotted the results for all data (black lines). Figure 1 shows the results. Solid lines are for the 99th percentile, whereas the stippled line is the 99.9th percentile of wet events, and the different colors represent "low", "average" and "high" relative humidity. As seen, the different subselections give a similar dependency of again 14 % per degree, yet with considerably more noise. It is also clear that a low relative humidity gives (at the same value of the absolute humidity, that is, Tdew) higher extremes. This finding can be most likely attributed to the larger instability of the atmosphere in those cases. Also interesting is that for the lowest dew point temperatures the dependency on relative humidity vanishes, which could be explained since at those low temperatures large scale systems (and not convective) are the primary source of precipitation extremes. The answer to your point is therefore. There is a dependency of the extremes on the relative humidity. However, the scaling behavior is not affected by this dependency on relative humidity as the different relative humidity classes give similar dependencies on the dewpoint temperature of 14 % per degree.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 4701, 2011.

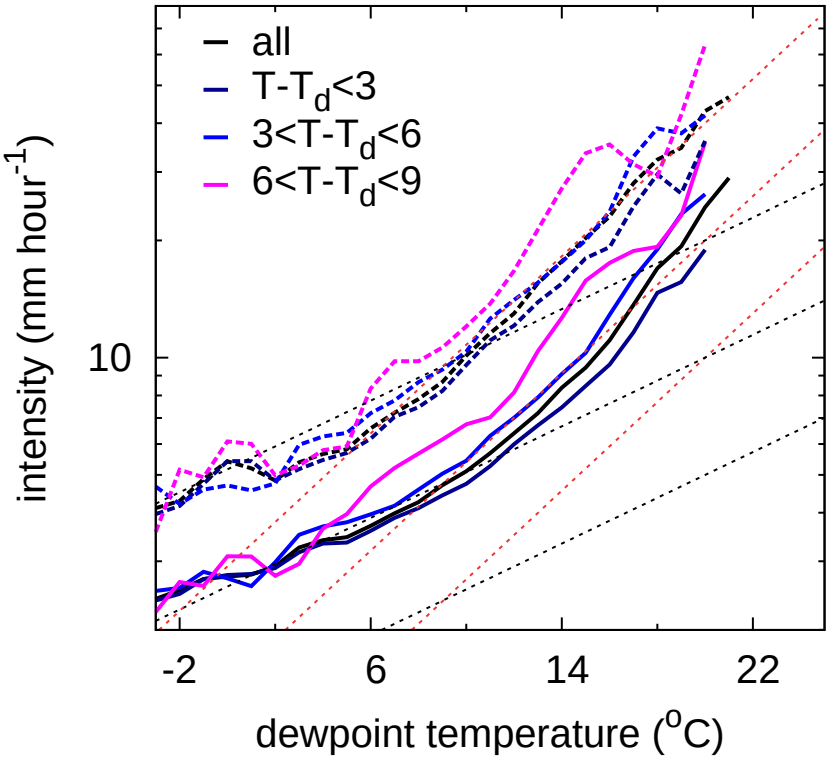

Fig. 1. Dependency of extremes on the dew point temperature in different classes of relative humidity (measured by T-Tdew) (see text)

HESSD

8, C2343–C2345, 2011