Quantifying the Temporal Persistence of Meteorological Events

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Days with a particular meteorological event like precipitation, thunder, fog, etc., typically do not occur alone, but in more or less well defined groups. For example, a sequence of days with and without precipitation is not (completely) random, but a clear tendency of grouping into wet and dry spells is usually observed. The temporal persistence of continuous meteorological elements is well described by Pearson correlation coefficient. However, in case of discrete meteorological elements there is no single commonly accepted measure which would express the persistence quantitatively and provide convenient means for comparison of results from various studies. In this work tetrachoric correlation coefficient is proposed as a measure that is most appropriate for quantifying temporal persistence of discrete events.