# Global variations of atmospheric relative humidity as observed by AIRS

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Atmospheric water vapour plays a key role in the climate and numerical model calculations suggest that global mean relative humidity (RH) stays approximately constant in global warming scenarios. Here, we analyse the September 2002 to April 2011 daily mean free tropospheric relative humidity (RH) data from the Atmospheric Infrared Sounder (AIRS), version 5 level 3 data at a spatial resolution of 1x1 degree longitude/latitude. We perform a multiple linear regression analysis with harmonics, trend and an El-Nino/Southern Oscillation (ENSO) index. In addition to visualisation of the global RH distribution, we examine the consequences and implications of spatial averaging and quantify the contribution of all terms to the global mean relative humidity time series.

A similar regression analysis is applied to the 2.5 degree resolution monthly precipitation data provided by the Global Precipitation Climatology Project (GPCP). We discuss the implications for long term predictability and quantitatively compare the systematic and stochastic components. For both data sets we mention some of the obstacles in the way of accurately quantifying the trend or "climate change" term with such simple methods.