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Stable isotope (^{2}H, ^{17}O, ^{18}O) and hydro chemical patterns of precipitation collected in weekly resolution at Hannover, Germany

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Long-term observations of stable isotopes (δ^{18}O and δ^{2}H) in precipitation were initiated in May 2008 at the Federal Institute of Geosciences and Natural Resources (BGR) in Hannover, Germany. In 2014 all precipitation samples were re-analyzed because a purchase of a new laser spectrometer (Picarro L2140-i) now allowed measurements of δ^{17}O and a calculation of the ^{17}O-excess parameter. Starting in October 2015 a routine analysis of hydro chemical parameters was added whenever enough sample aliquot was available (major ions, trace elements).

A discussion of the stable isotope data of the seven year series of weekly precipitation samples (n = 370) will be presented. Beneath general patterns (seasonality and trends) we also focus on importance of amount weighing procedures, corrections for minor rain amounts, aspects of sample storage and re-analyzes, as well as impacts through changes in analytical equipment (IRMS, CRD spectroscopy) which is visible from the data.

For stable isotopes a Thermo Fisher delta plus IRMS (Gasbench and H-Device) was used until 2011 and from 2012 on a Picarro L2120-i water vapor analyzer with long-term accuracies for quality check samples better than 0.2‰ and 0.8‰ for δ^{18}O and δ^{2}H, respectively.