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The multi-isotope compositions of surface waters from arid and humid marginal seas: Baltic Sea, Black Sea, and Mediterranean Sea

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The hydrological cycle in different climate zones is reflected by specific water isotope fractionation processes. Traditionally, investigations focused on the fractionation of the isotopes H-1, H-2, O-16, and O-18. With the development of new analytical methods, also the consideration of the O-17 isotope went into the focus of interest. We followed the multi-isotope fractionation in sea surface waters of marginal seas from different climate zones (Baltic Sea, Black Sea, Mediterranean Sea) to follow the relationships between different hydrocycles and the developing isotope signatures.

Stable isotope measurements were conducted by means of the new Picarro cavity ring down spectrometer (CRDS) system (L2140-i) giving results in the usual delta-notation versus V-SMOW, and H-2 and O-17 excess values are derived. Results are compared to continuous measurements at relevant GNIP stations and the GMWL. It is found that the slopes between normalized O-17 and H-2 contents as well as H-2 and O-17 excess values differ for the investigated aquatic systems.