



## **Oxygen and hydrogen stable isotope content in daily-collected precipitation samples at Dome C, East Antarctica**

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Antarctic ice cores allow to obtain exceptional past climate records, thanks to their water stable isotope content, which provides integrated tracers of the atmospheric water cycle and local climate. Low accumulation sites of the East Antarctic plateau provide the oldest ice core records, with the record-breaking EPICA Dome C drilling covering the last eight climate cycles. However, the isotope-temperature relationship, commonly used to derive the temperature, may be characterized by significant geographical and temporal variations. Moreover, post-depositional effects may further complicate the climate interpretation. A continuous series of precipitation data is needed in order to gain a better understanding of the factors affecting the water stable isotopes in Antarctic precipitation at a specific site. In this study, we use the first and so-far only multi-year series of daily precipitation sampling and isotope measurements from the French-Italian Concordia Station, located at Dome C in East Antarctica (75°06'S 123°21'E; elevation: 3233 m a.s.l.; mean annual temperature: -54.5°C; snow accumulation rate: 25 kg m<sup>-2</sup> yr<sup>-1</sup>), where the oldest deep Antarctic ice core has been retrieved. Surface air temperature data have been provided by the US automatic weather station (AWS), placed 1.5 km away from the base, while tropospheric temperature profiles are obtained by means of a radiosonde, launched once per day by the IPEV/Italian Antarctic Meteo-climatological Observatory. The new dataset also enables us for the first time to study the isotope-temperature relationship distinguishing between different types of precipitation, namely diamond dust, hoar frost and snowfall, identified by the observations carried out by the winter-over personnel collecting the snow samples. Here we present the complete data series of water stable isotopes in precipitation at Dome C spanning the time period from 2008 to 2014, in the framework of the PNRA PRE-REC project.