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Modelled response of water isotopes in the Earth′s system after volcanic eruptions

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Volcanic fingerprint in the atmosphere circulation over the North Atlantic is analysed in a coupled, isotopic enabled, atmospheric-ocean climate model (ECHAM5-wiso MPI-OM) driven by volcanic aerosols, solar forcing, greenhouse gases, land-use and orbital variations for the time interval 800-2000 AD. Identification of four weather patterns, the Atlantic Ridge, Scandinavian Blocking, NAO- and NAO+ has been done using 500mb geopotential height. Stable water isotopic pattern associated with the weather patterns was then retrieved and analysed with the aim to construct a template to be used to understand the atmospheric circulation response in the aftermath of both large Equatorial and North Hemispheric volcanic eruptions. A comparison with GNIP data in the North Atlantic will shed light on the reliability of the modelled isotopic response. A gap exists in the knowledge of the dynamic climate response after large volcanic eruptions. Understanding the climate response in the hydrological cycle after volcanic events plays a fundamental role in bridging that gap.