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Interaction between precipitation and river water in the Northern Carpathian Mountains, Romania

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The aim of this study is to investigate the isotopic composition of δ^{18}O and δ^{2}H in precipitation and river water from the northwestern part of Romania. All precipitation samples are used to define Local Meteoric Water Line (LMWL), the relationship between the isotopic composition of precipitation and river water and between δ^{18}O and deuterium excess, the relationship between stable isotopic variability in precipitation and moisture origins. For this study, we collected monthly samples of water precipitation from six stations: Vatra Dornei, Gura Haitii, Campulung Moldovenesc from October 2014 until Jun 2015, and from Rarau, Suceava and Bistrita-Nasaud stations from March 2012 until December 2017. River water was collected from Moldova River at Campulung Moldovenesc station from October 2014 until February 2016. Here we find that the seasonal δ^{18}O in precipitation is in agreement with the seasonal temperature variability, as shown by the significant correlation coefficient (r = 0.77) and which shows that the temperature is the key controlling factor of δ^{18}O variability in precipitation water in this region. The Local Meteoric Water Line in the Northeast part of Romania is defined by the equation δ^{2}H = 7.79*δ^{18}O +7.46, (r^2 = 0.985, n=169).