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Southern Europe hydroclimatic oscillations at MIS 5a

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The front section of marine isotope stage (MIS) 5a, 84.5-76.0 ka, after an abrupt global temperature rise from MIS 5b, 95.0-84.5 ka, has been considered as a good analogue for understanding the anthropogenic impact of current global warming on Earth. However, lack of well-calendared paleoclimate records hampers our understanding of regional climatic change and global links on centennial-to-millennial scales. Here, we present a 230Th-dated stalagmite δ18O-inferred precipitation time series during 83.7-80.2 ka from Observatoire Cave (43°44'N, 7°25'E), Monaco, southern Europe. It shows a millennial decreasing precipitation trend from 83.7 to 82.5 ka with an abrupt 200-yr wet event at 82.7 ka and a rapid shift from aridity to wetness during 82.5-82.4 ka, followed by a relatively stable condition at 82.4-80.2 ka in southern Europe. This hydroclimatic variability concurs with the decrease sea surface temperature in the Mediterranean and an ice rafted debris event in Nordic Sea on multi-centennial-to-millennial scales. Coupled with published global proxy records, the results show that southern Europe hydroclimate is dominantly influenced by high latitude in the northern hemisphere and westerlies. The results suggest that southern Europe is sensitive to the climate change and ice sheet variability in high-latitude northern Eurasia.