

## Figure Captions

Fig. 1 The study area (a) Watershed of Upper Blue Nile River Basin in Ethiopia (b) Precipitation sampling sites: Addis Ababa, Debremarkos and Entoto Hill in the upper Blue Nile River Basin (c) Mean Monthly average Rainfall (1999-2002) of selected stations in the Upper Blue Nile River Basin.

Fig.2 The monthly weighted distribution of  $\delta^{18}\text{O}$  in Addis Ababa: bar graph represents the monthly average of rainfall (1964-2005) and 2014 vs.  $\delta^{18}\text{O}$  (‰) of simulation and observation in 2014 and amount weighted  $\delta^{18}\text{O}$  from GNIP data (1990-2009).

Fig.3 The monthly weighted distribution of  $\delta^{18}\text{O}$  in Debremarkos: bar graph represents the monthly average of rainfall (1964-2005) and 2014 vs.  $\delta^{18}\text{O}$  (‰) of simulation and observation in 2014.

Fig. 4 The amount weighted mean of  $\delta^{18}\text{O}$  (1961 – 2009) for Spring (FMAM) and Summer (JJAS) of GNIP  $\delta^{18}\text{O}$  (‰) for Addis Ababa

Fig. 5 Daily Variation of  $\delta^{18}\text{O}$  (‰) in observed precipitation from March 2014 to Oct 2014 in Addis Ababa versus IsoGSM simulation, respectively and the bar graph is daily precipitation of Addis Ababa.

Fig. 6 Daily Variation of  $\delta^{18}\text{O}$  (‰) in observed precipitation from July 2014 to Oct 2014 in Debremarkos versus IsoGSM simulation, respectively and the bar graph is daily precipitation of Debremarkos.

Fig. 7  $\delta^{18}\text{O}$  versus  $\delta^2\text{H}$  relationships in the daily data in 2014 (a) 139 daily precipitations in Addis Ababa (b) 80 precipitation in Debremarkos. The numerical formula in the figure is local meteoric water line (LMWL)

Fig. 8  $\delta^{18}\text{O}$  versus  $\delta^2\text{H}$  relationships of Addis Ababa daily rainfall events in 2014 (a) Spring (MAM) from 30 samples and (b) Summer (JJAS) from 109 samples in 2014

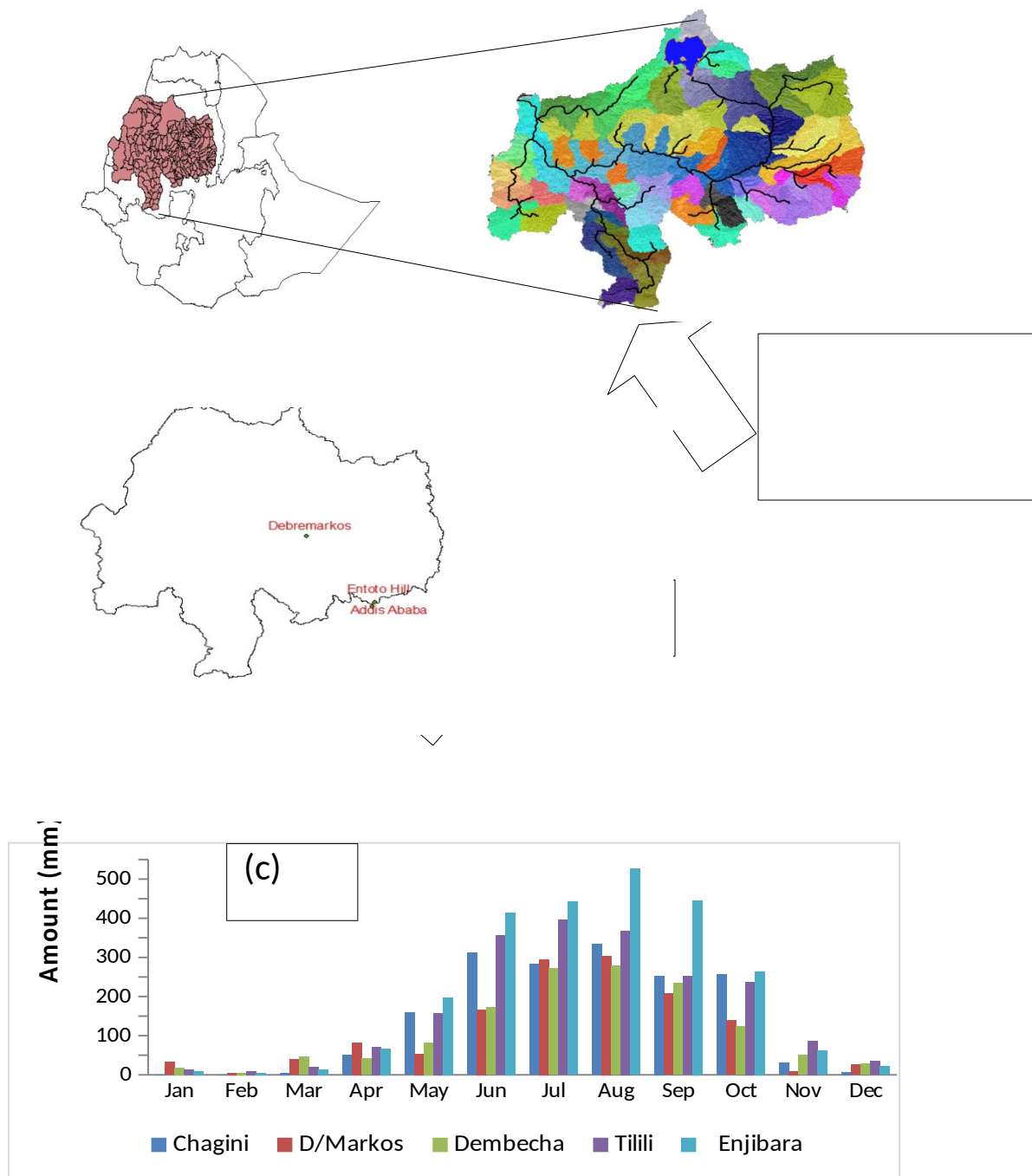


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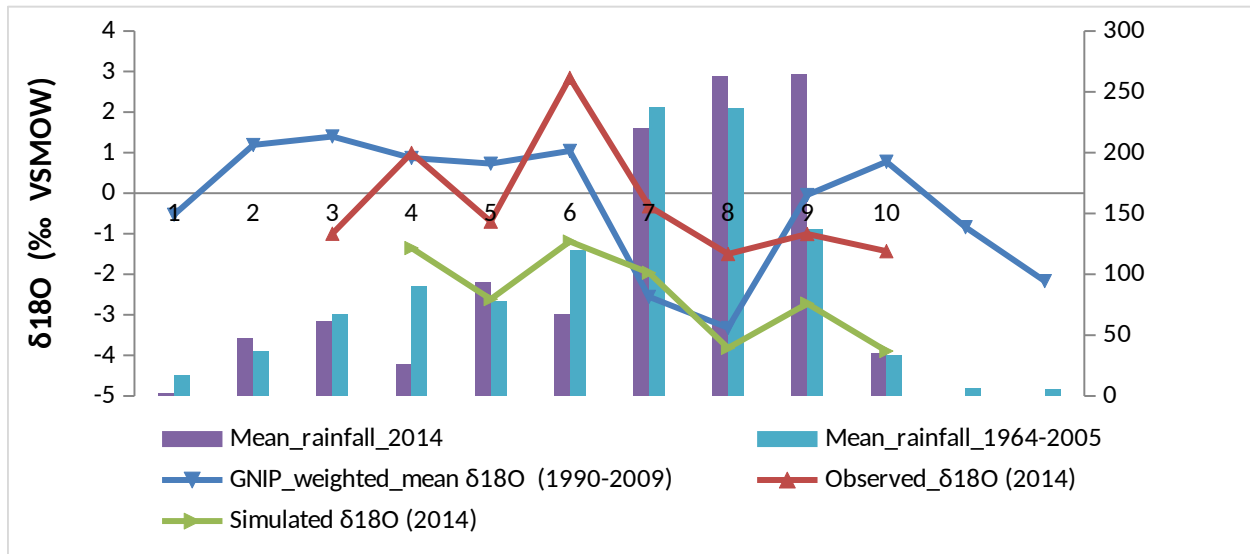


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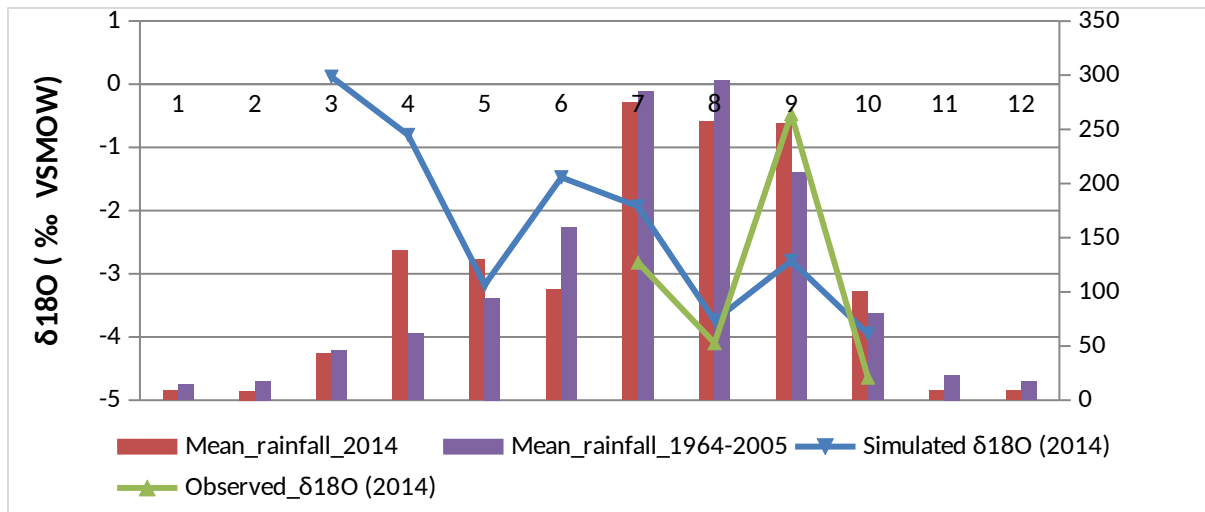


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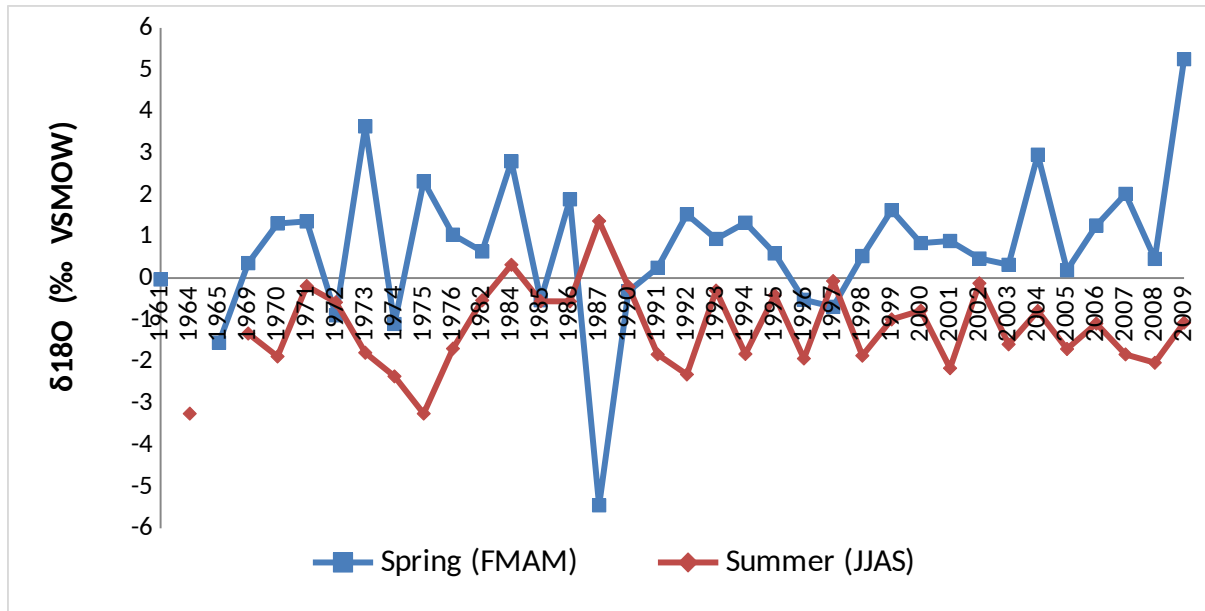


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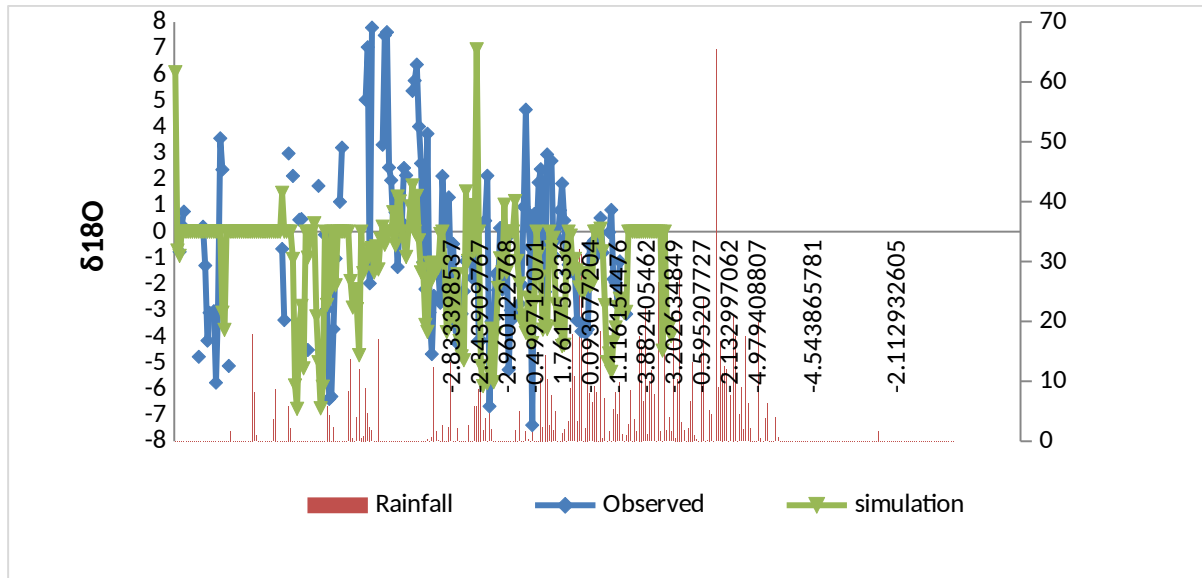


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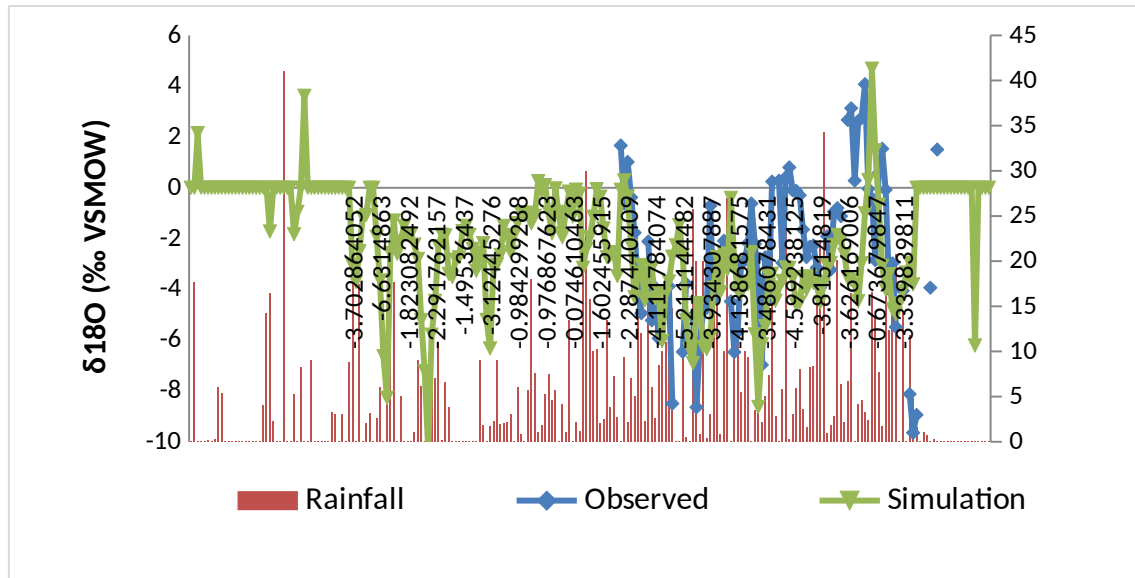


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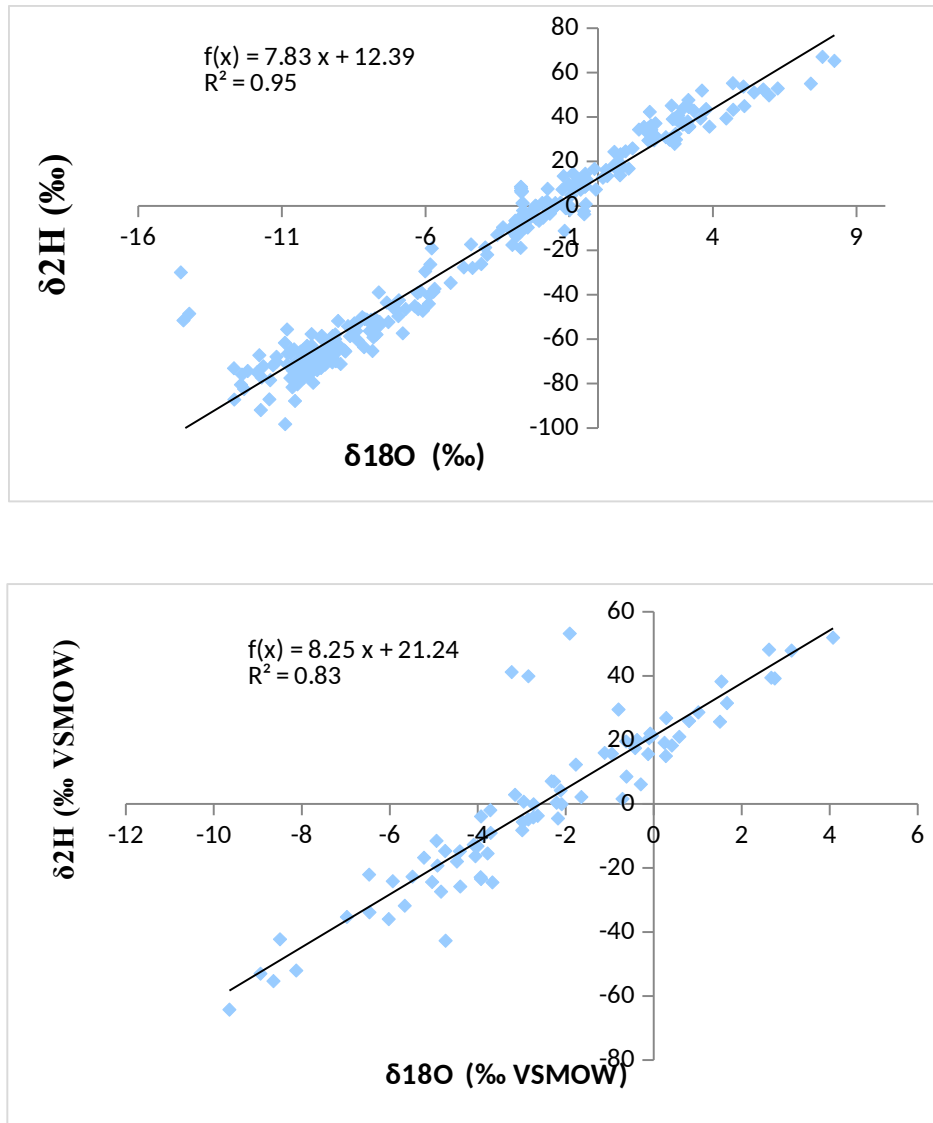


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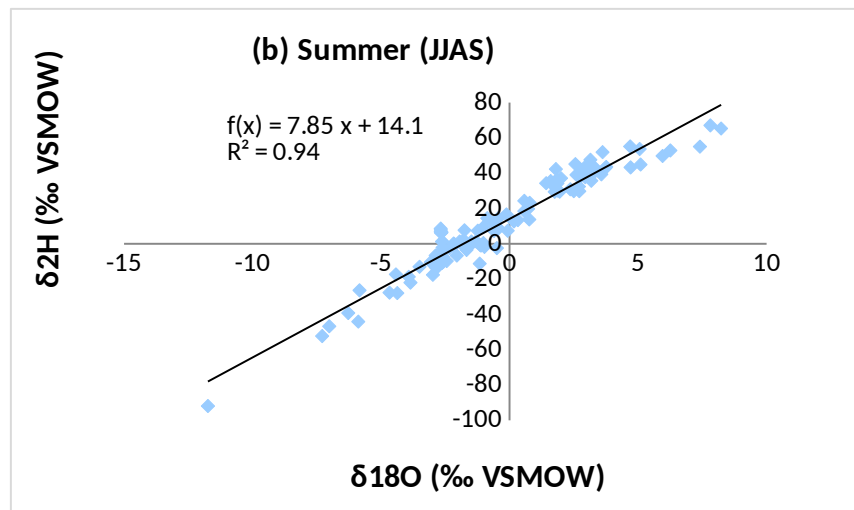
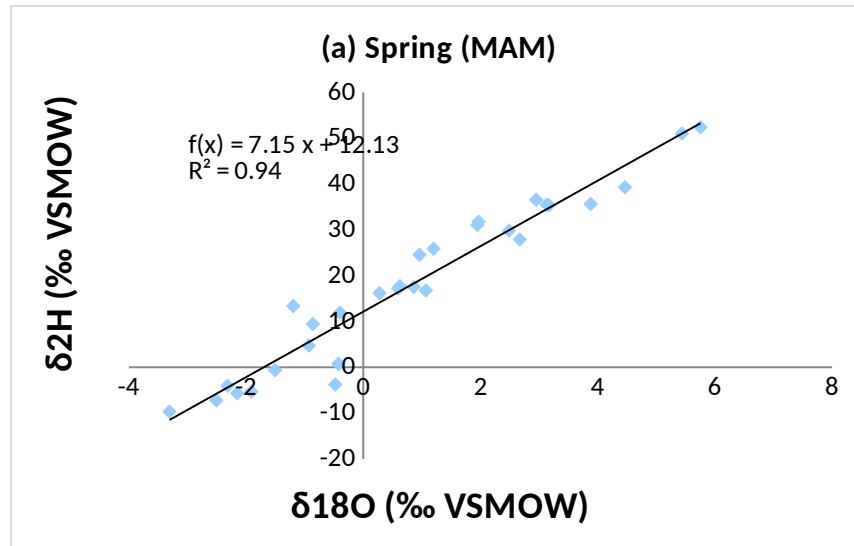


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