

PT AEVUS @ DWD

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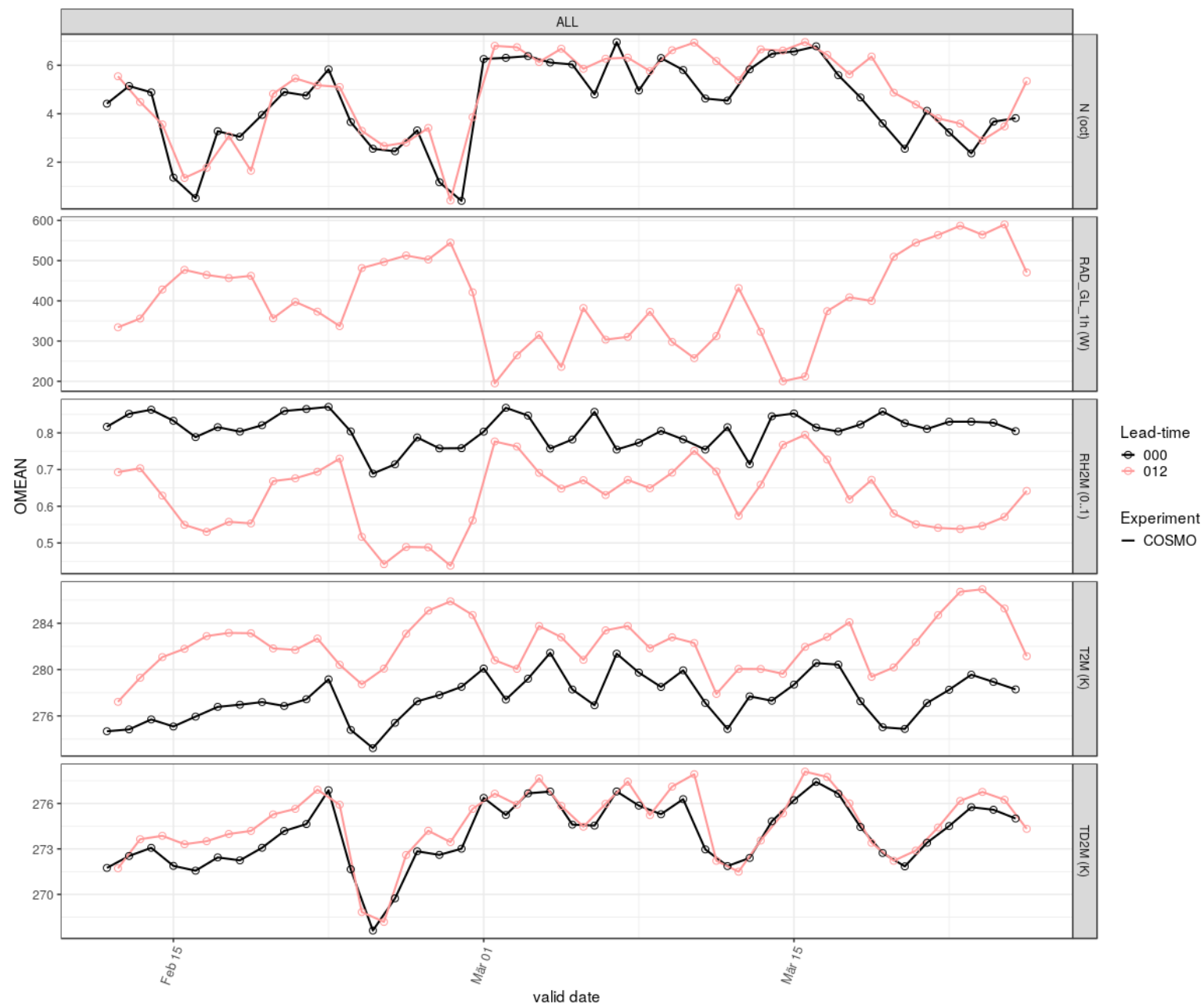
COSMO General Meeting, 9 - 12 Sep. 2019, Rome, Italy

COSMO-D2 experiment 10805

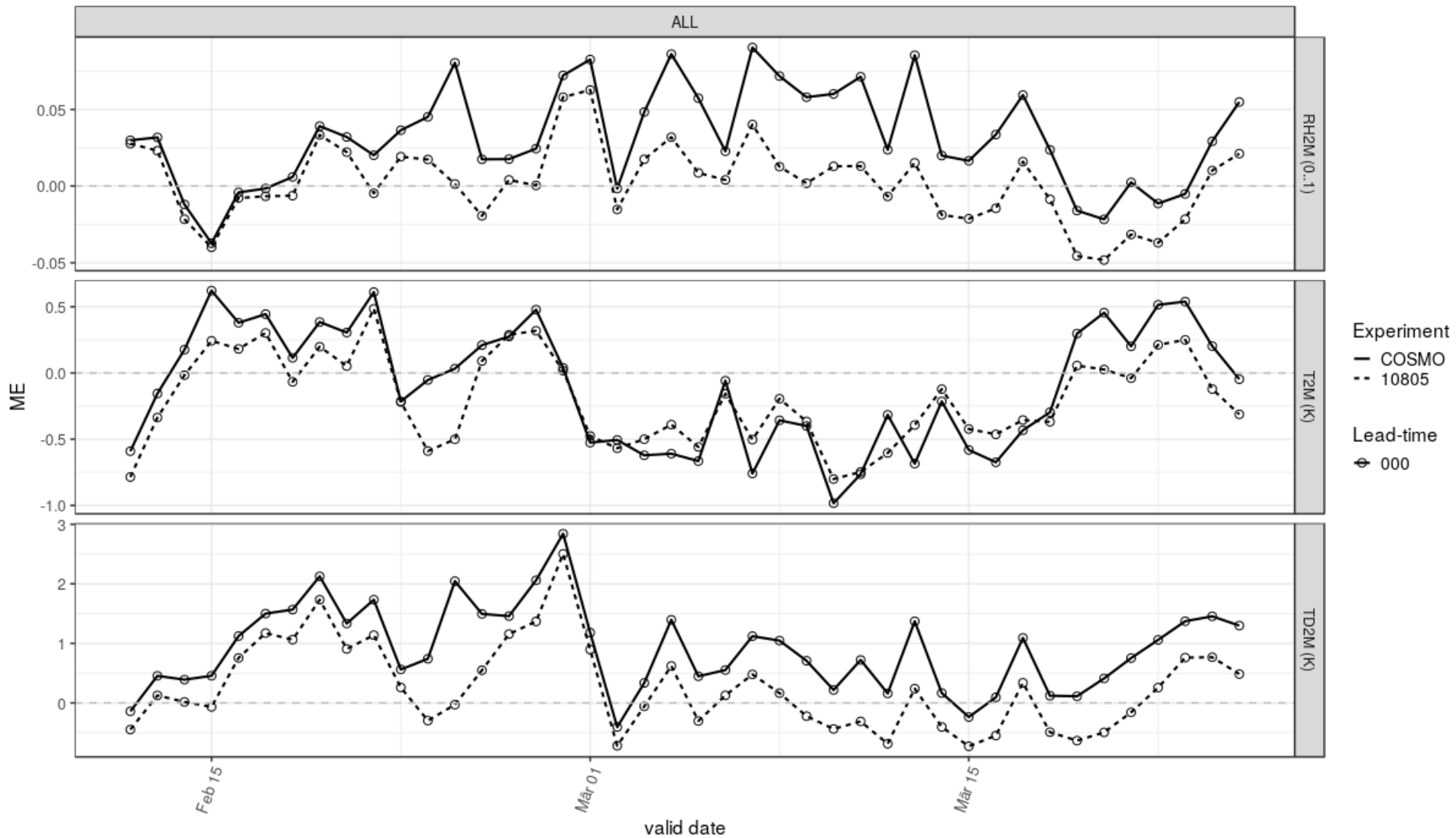
Simulation period: 11 Feb. – 25 Mar. 2019 (six weeks)

Namelists as in operational COSMO-D2, except for (in PHYCTL):

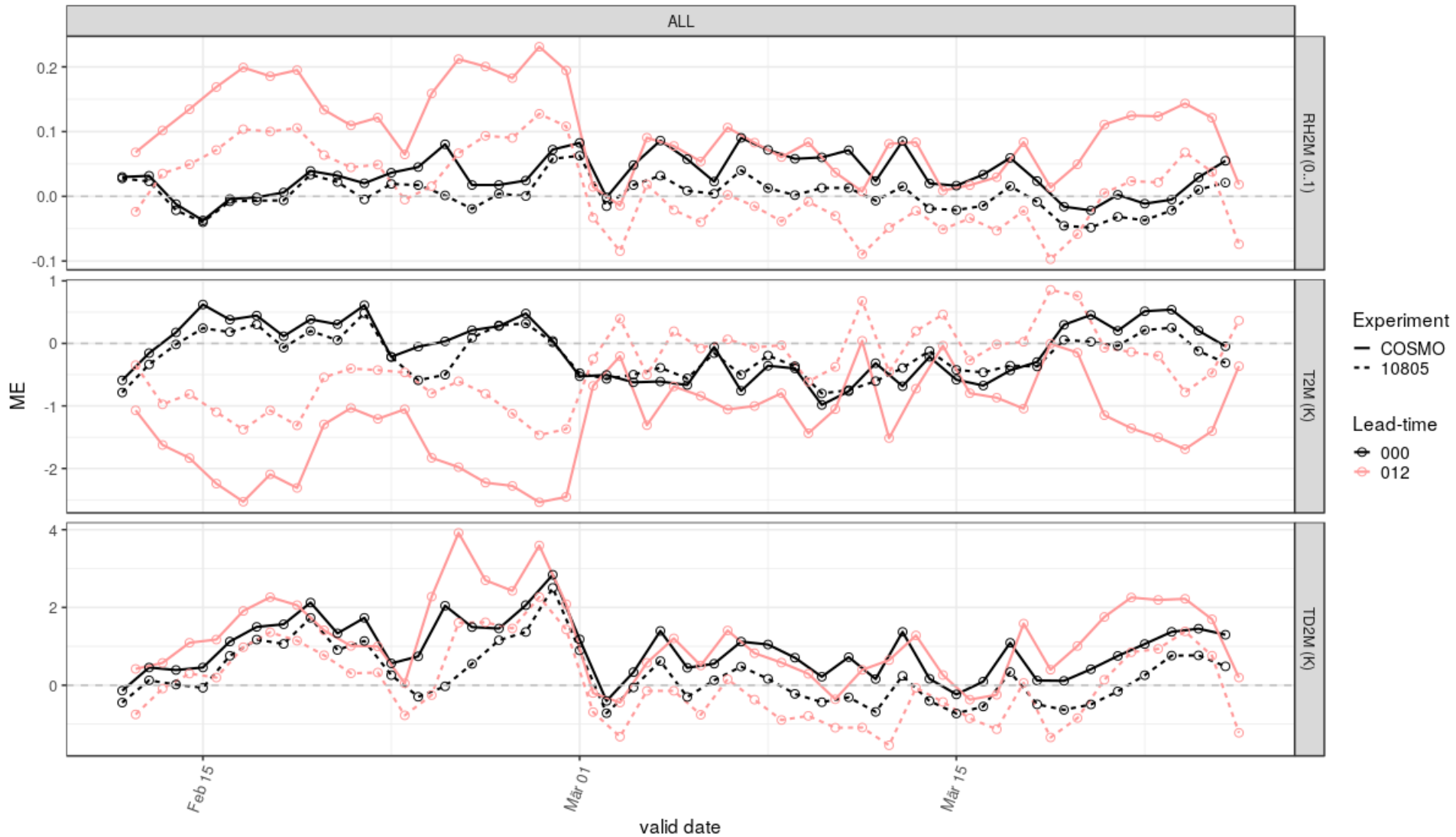
- `itype_evsl` = 4 : New bare soil evaporation
- `itype_root` = 2 : Exponential root profile
- `cwimax_ml` = 0.0005 : Interception reservoir activated
- `itype_heatcond` = 3 : Soil thermal conductivity dependent on moisture
- `itype_canopy` = 2 : Skin temperature



2019.02.11-21UTC - 2019.03.25-21UTC

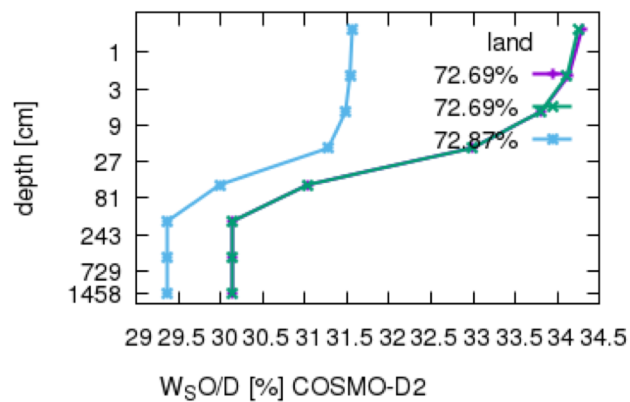
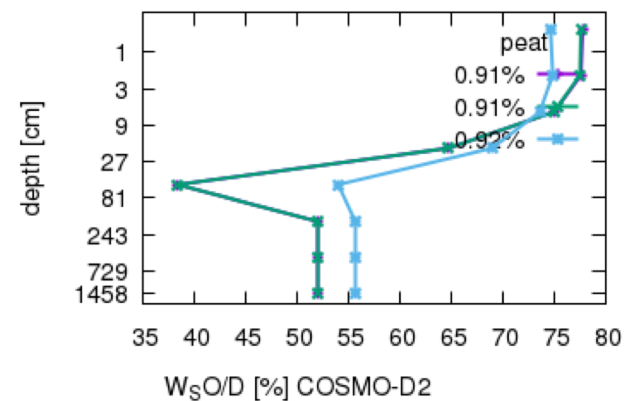
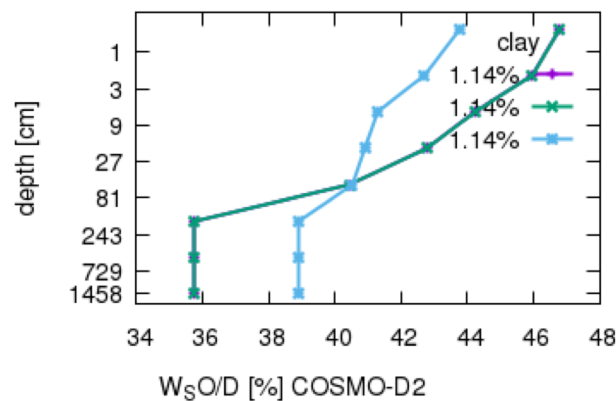
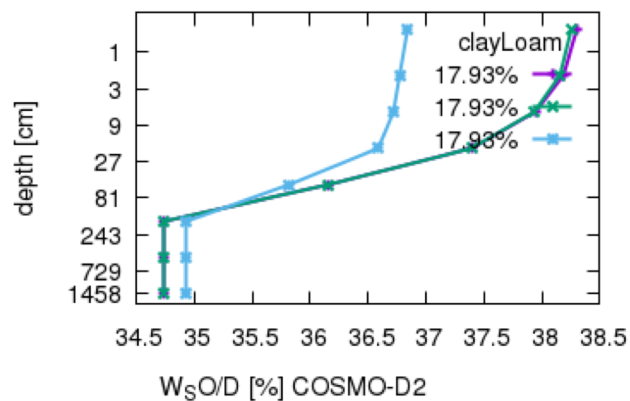
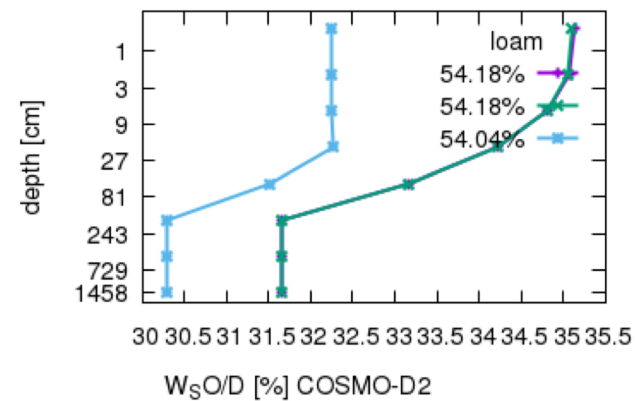
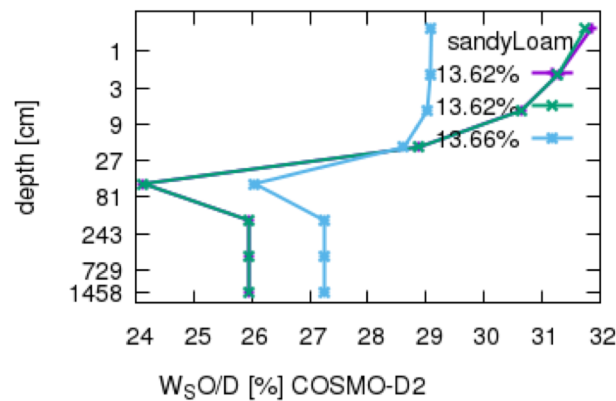
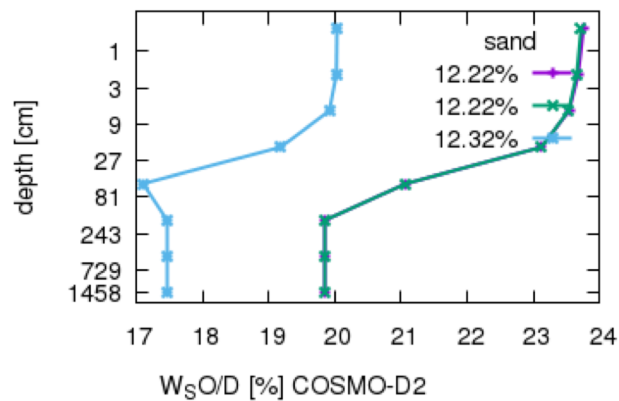


2019.02.11-21UTC - 2019.03.25-21UTC



Spin-up of the soil water content:

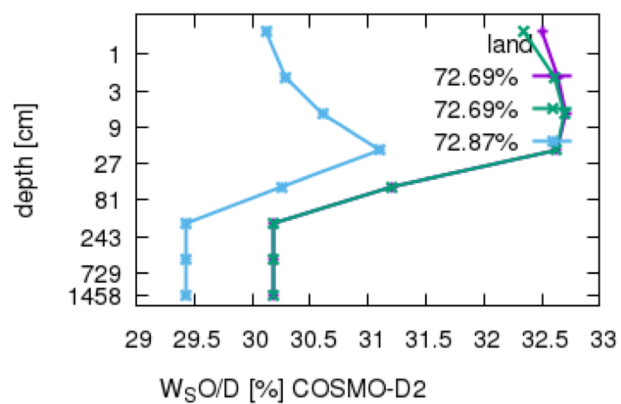
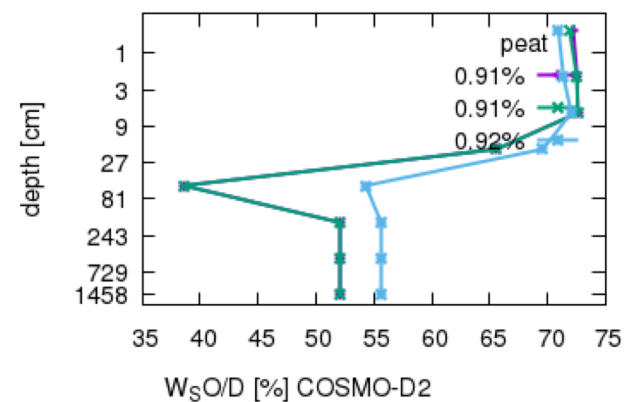
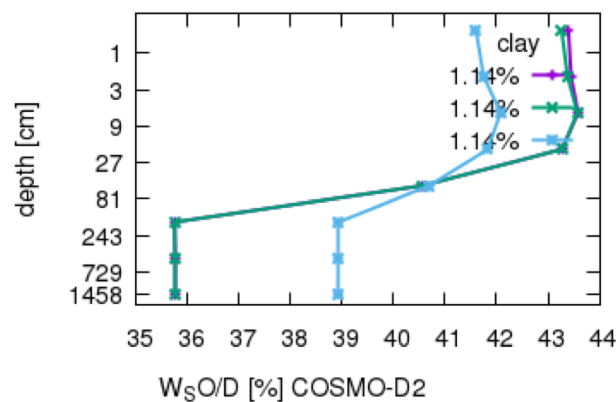
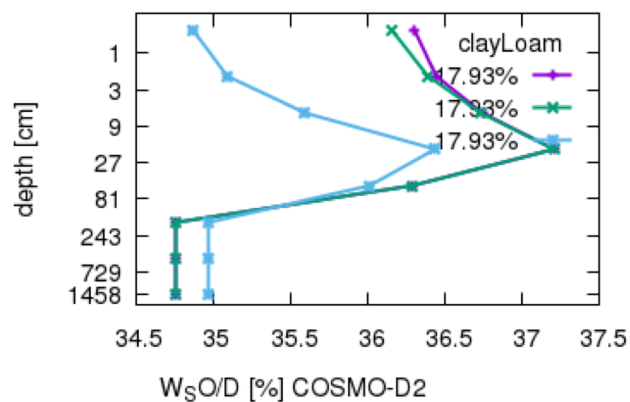
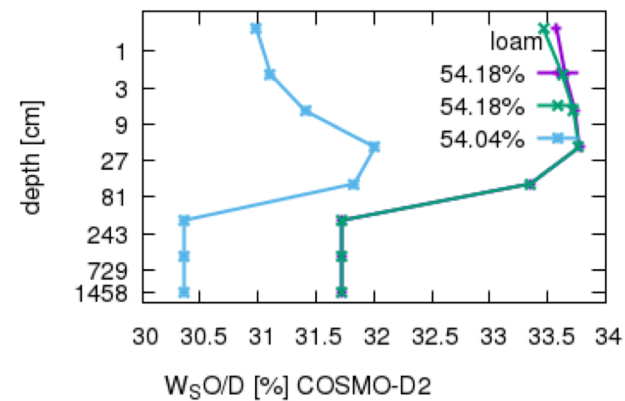
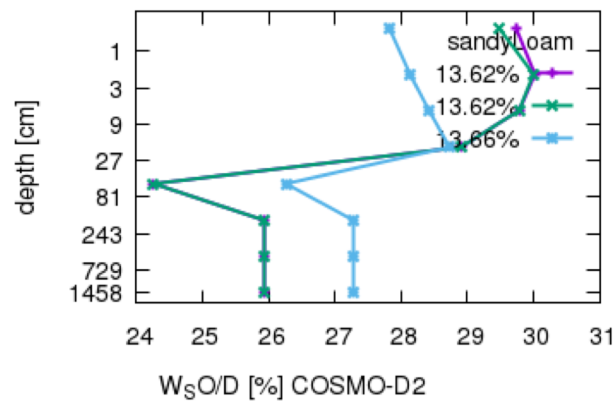
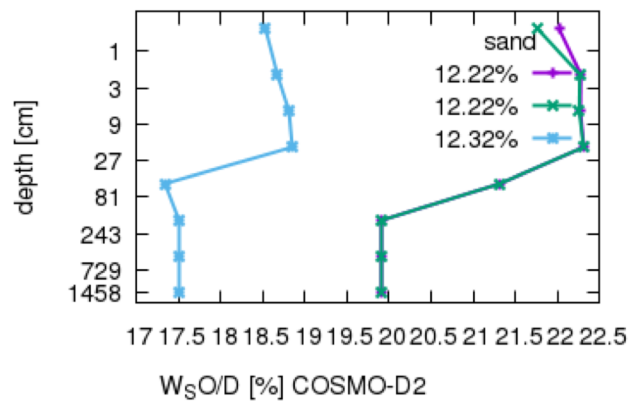
During the wet season no problem.



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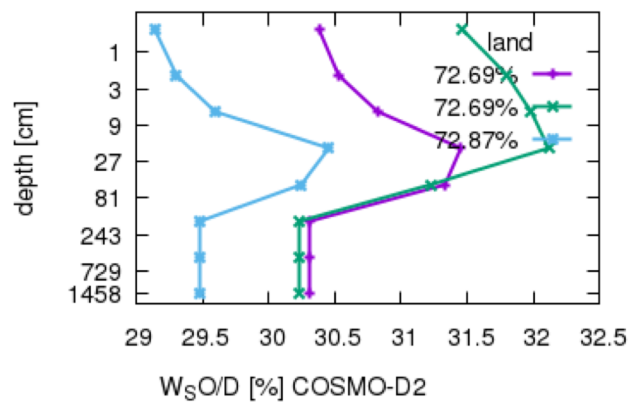
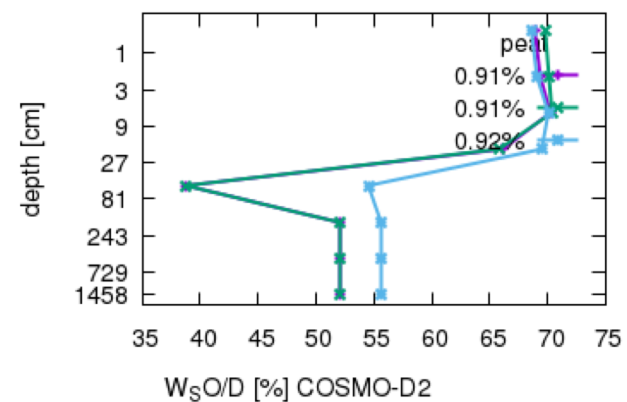
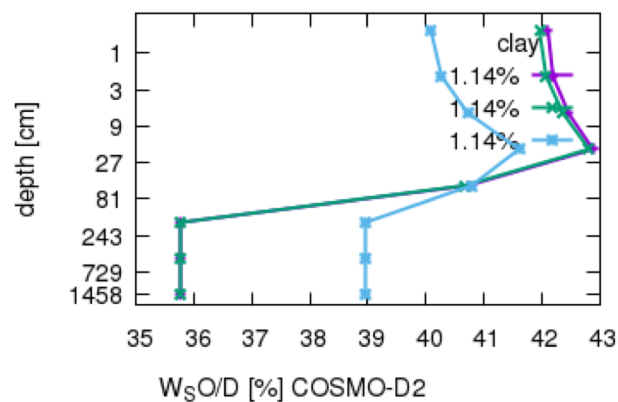
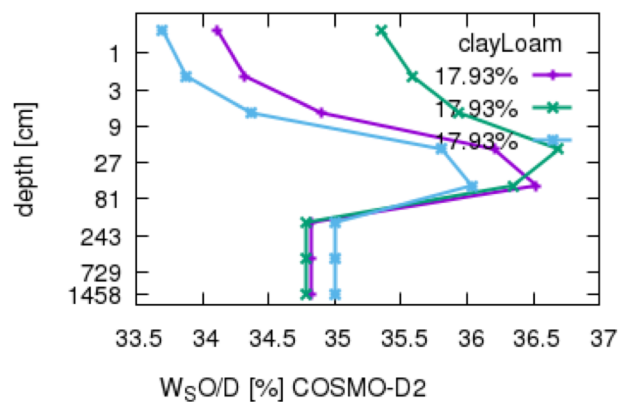
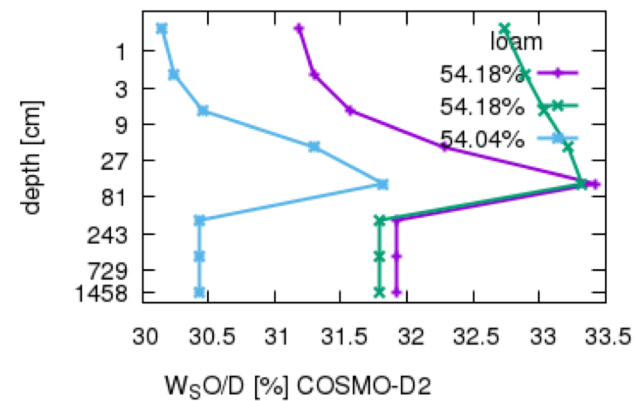
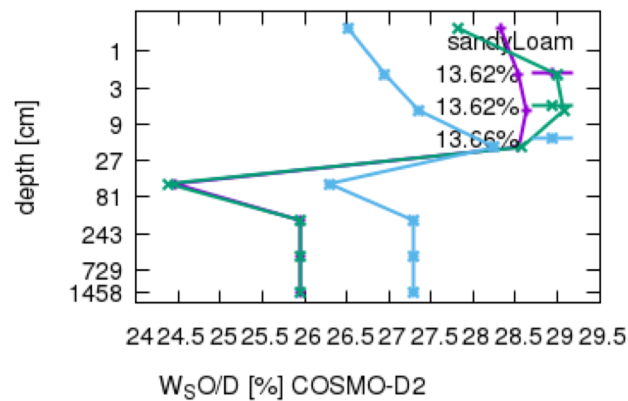
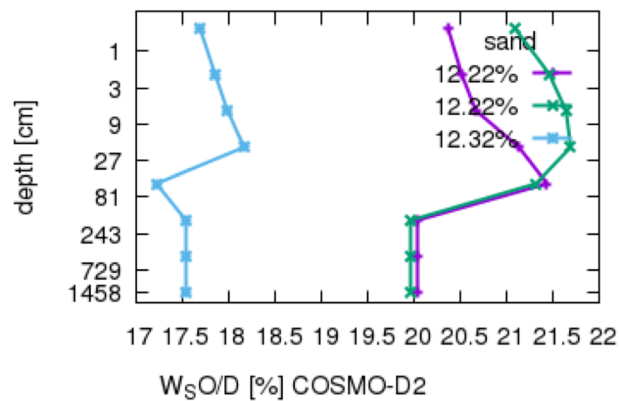
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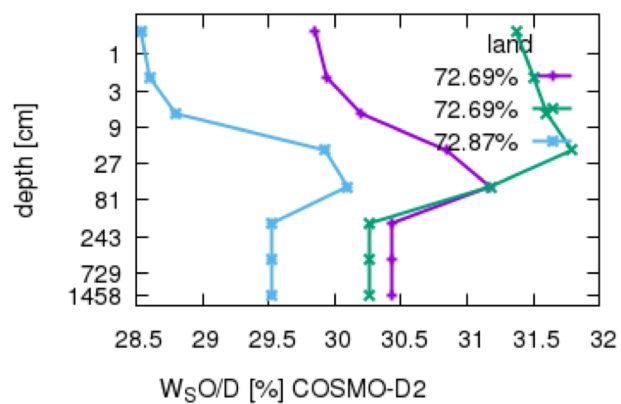
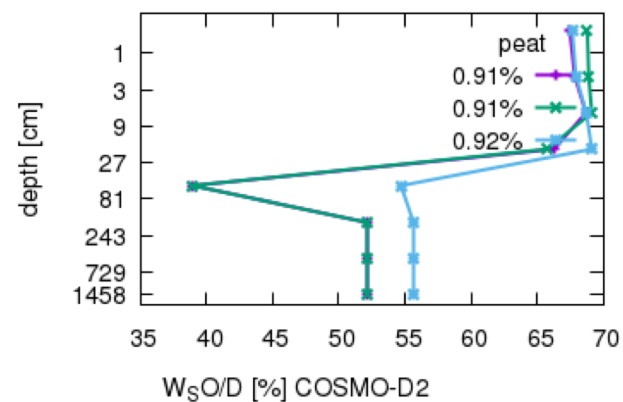
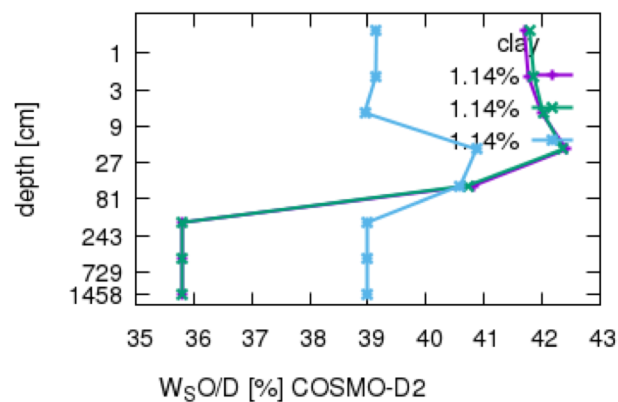
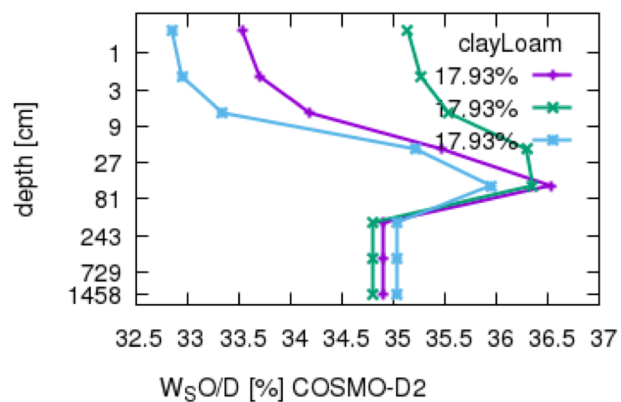
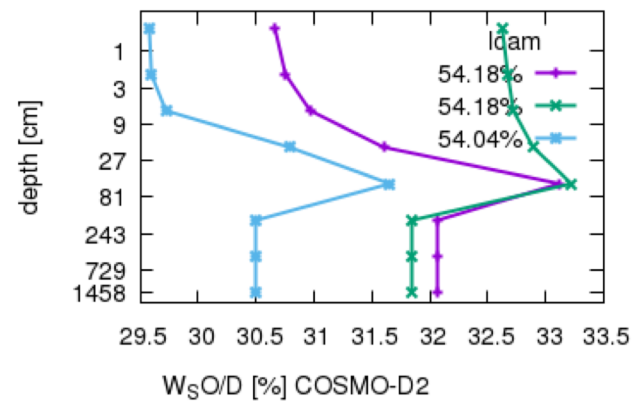
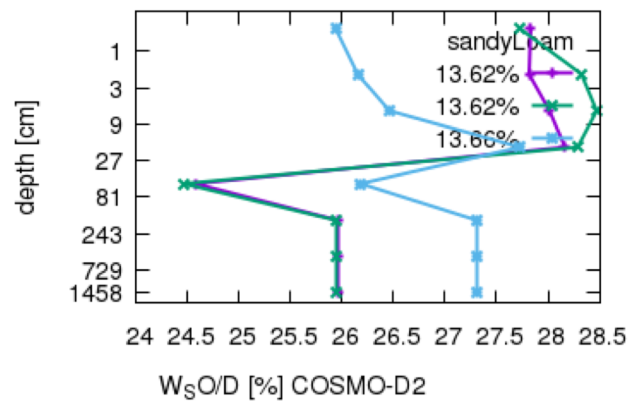
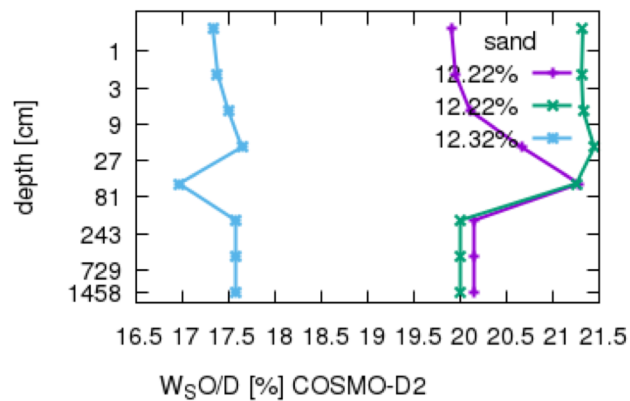
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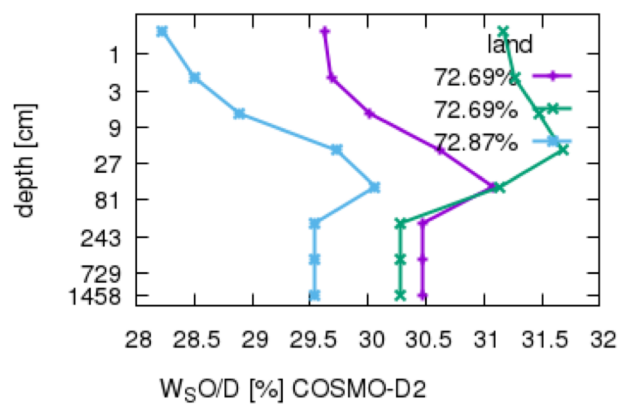
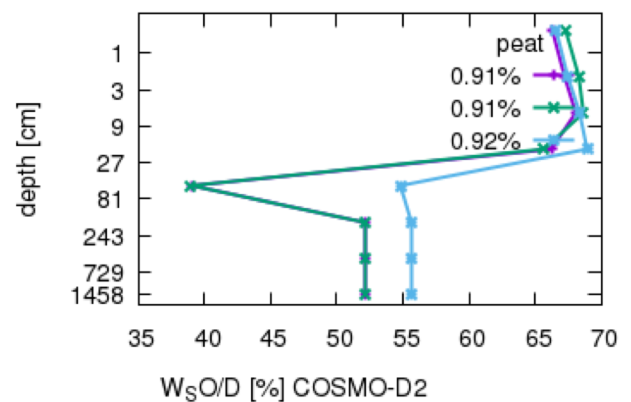
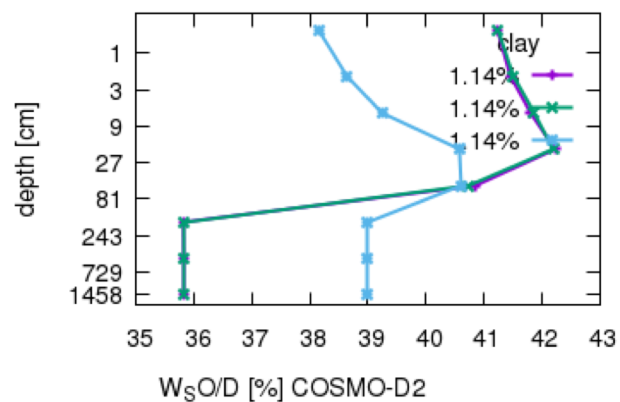
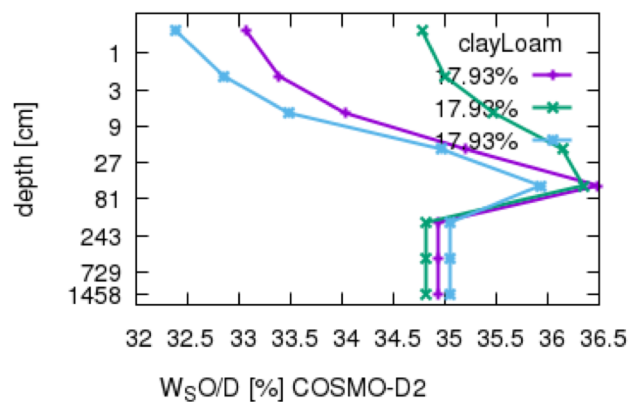
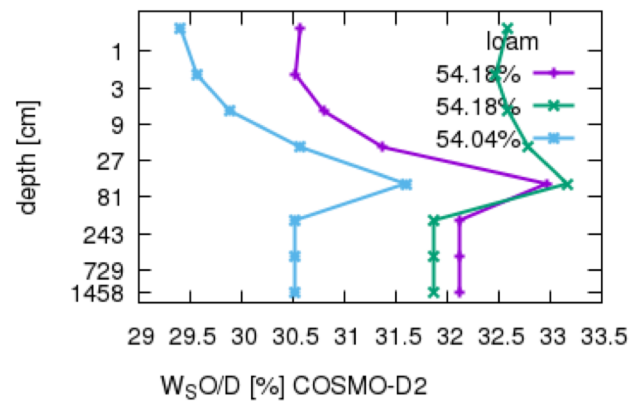
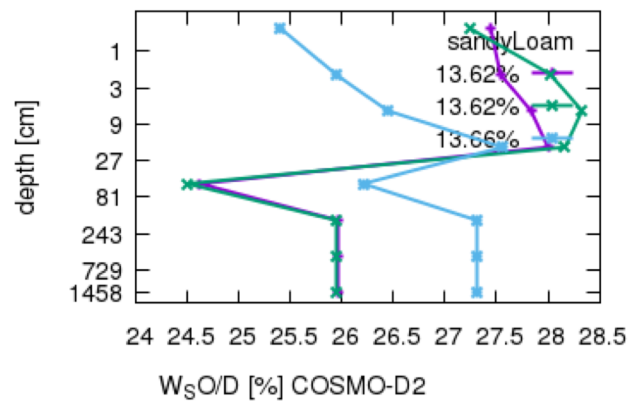
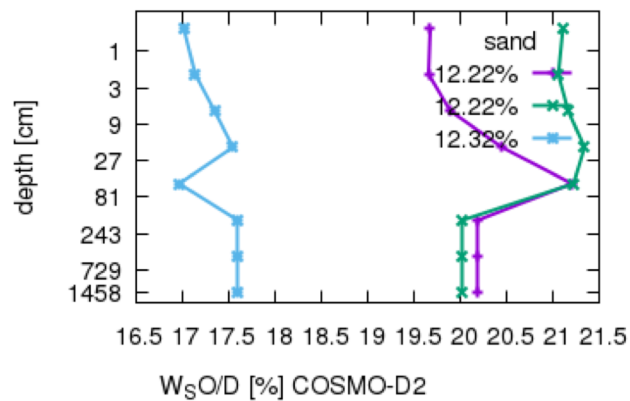
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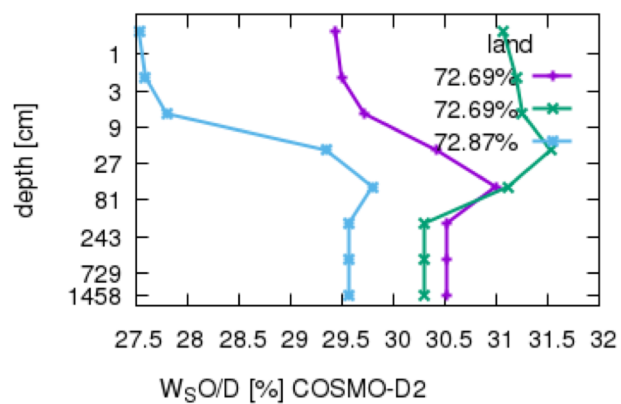
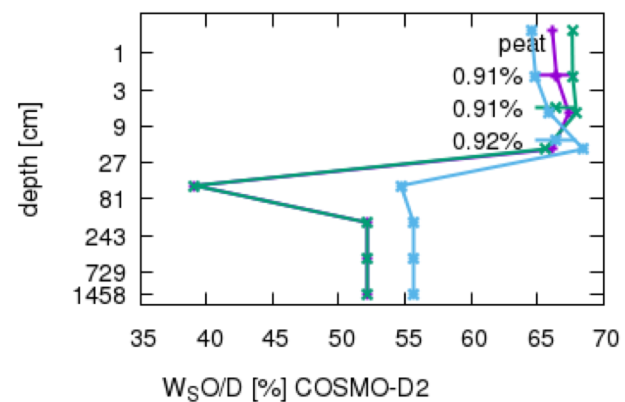
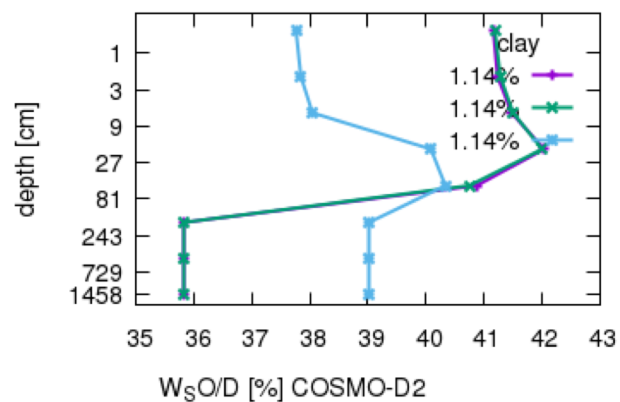
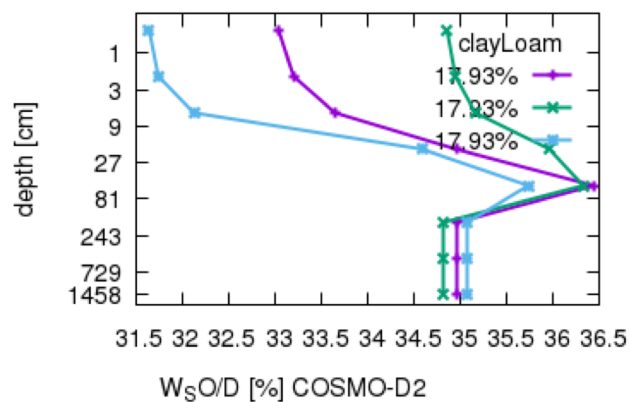
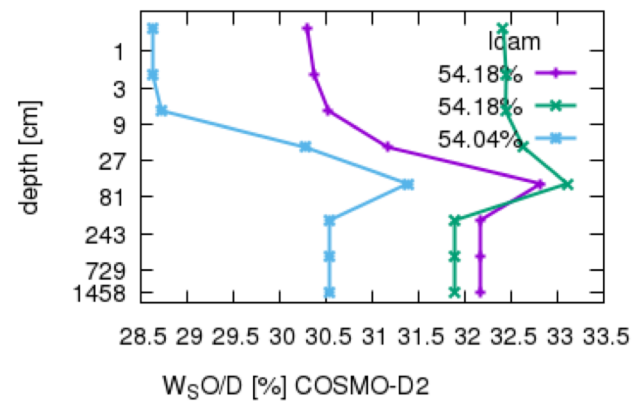
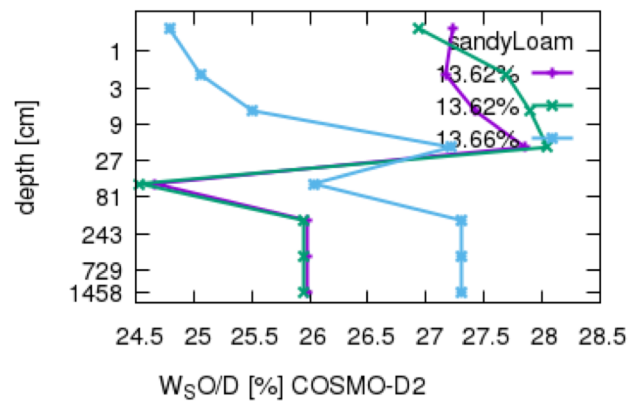
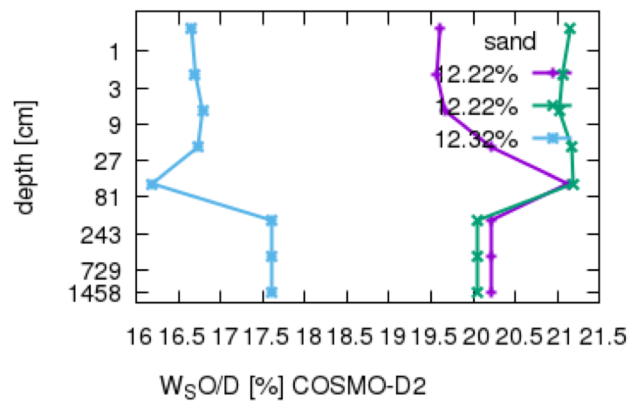
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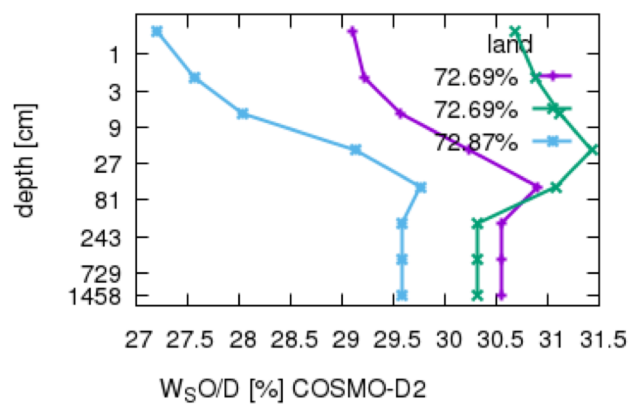
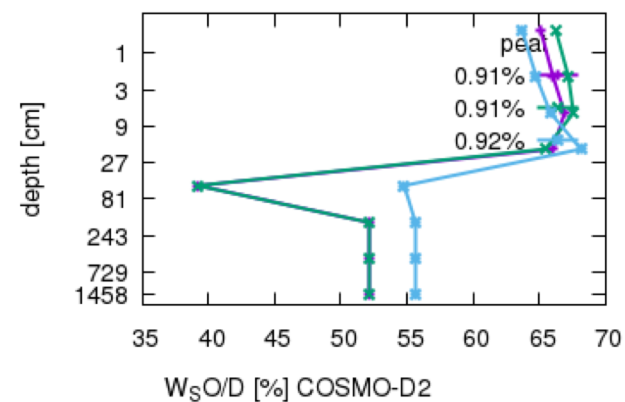
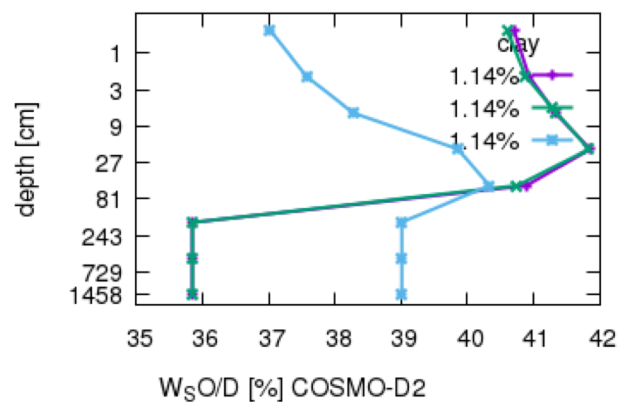
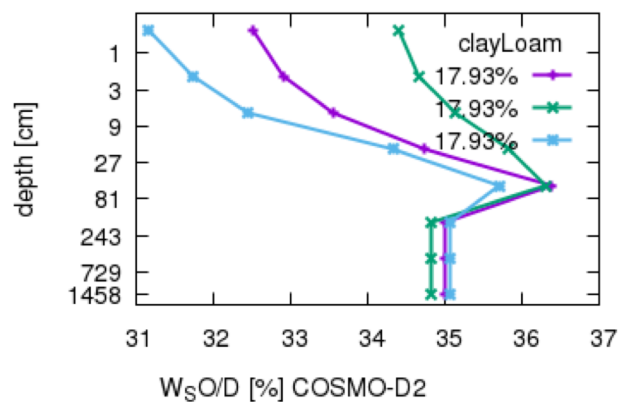
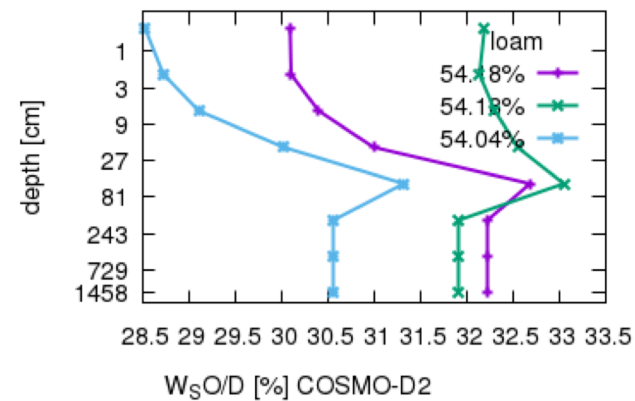
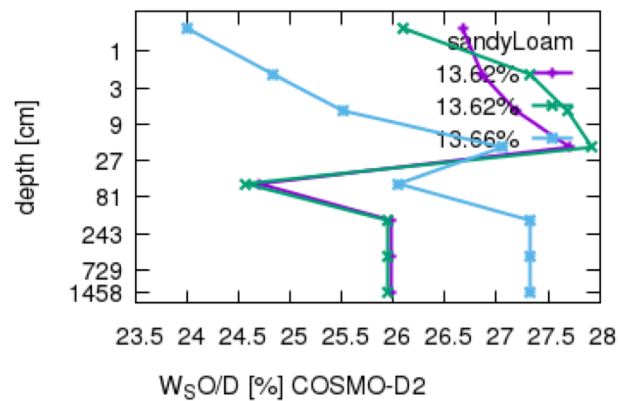
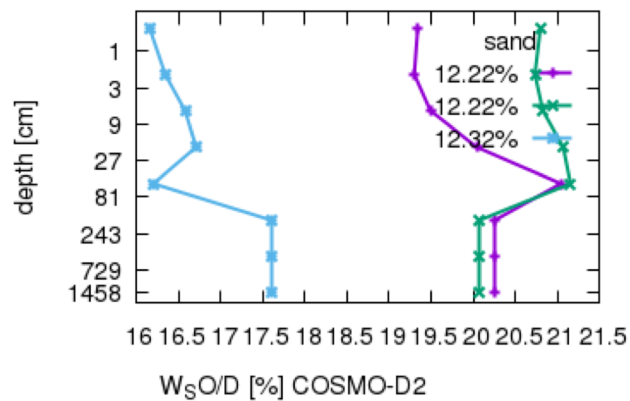
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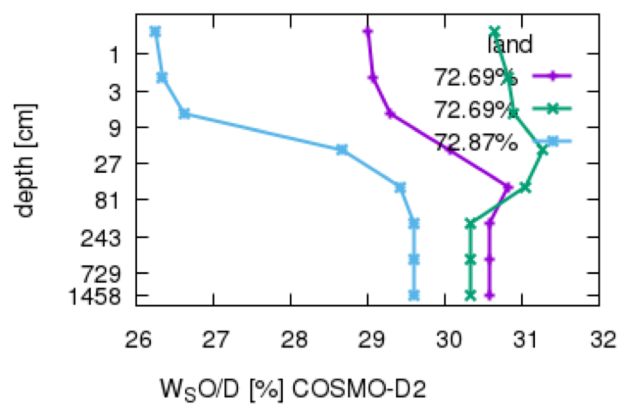
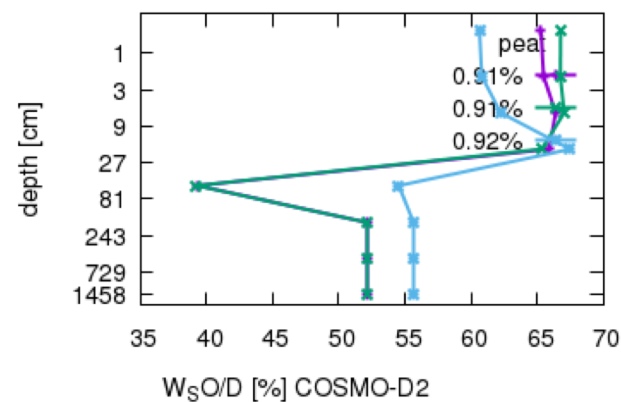
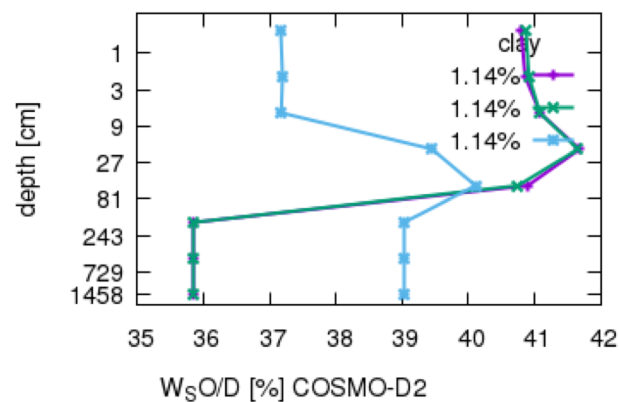
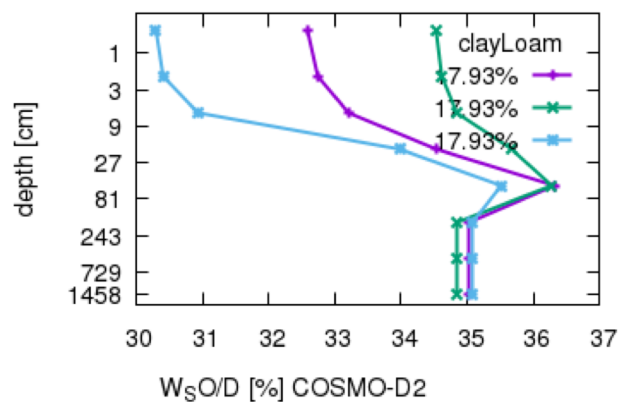
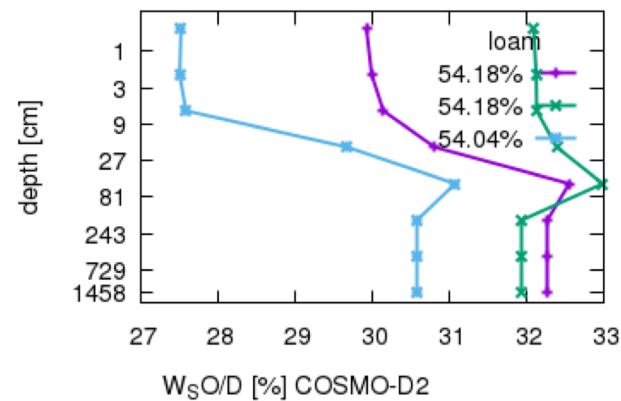
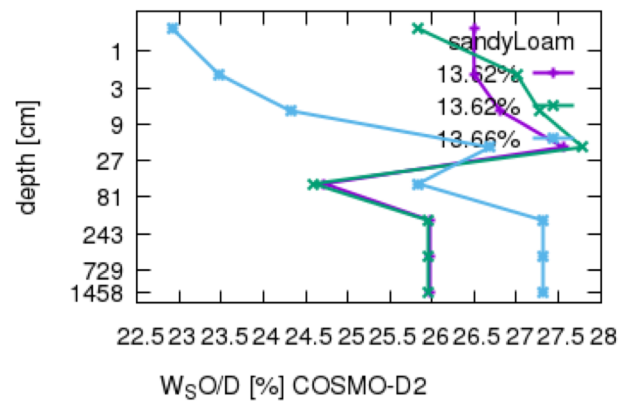
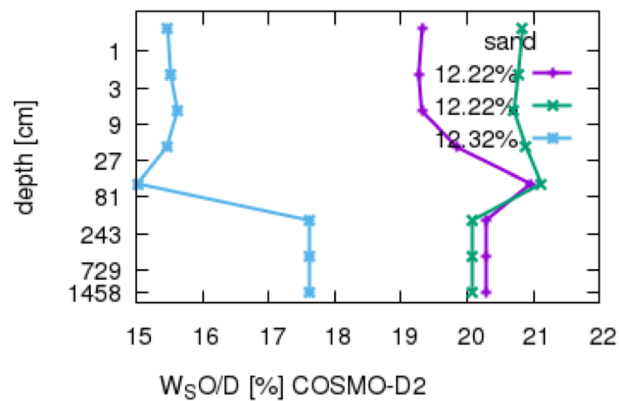
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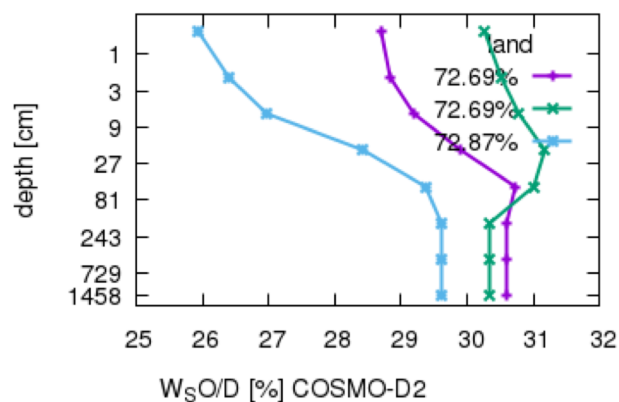
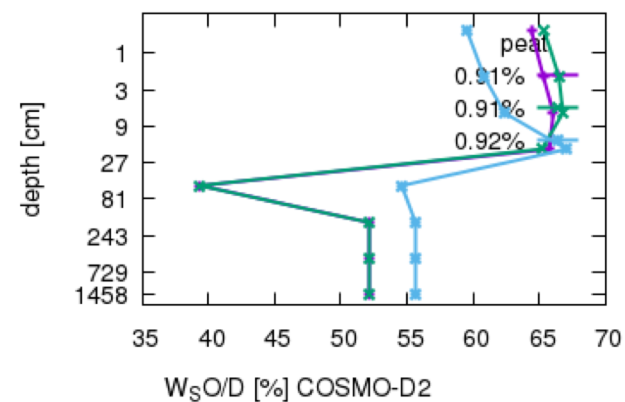
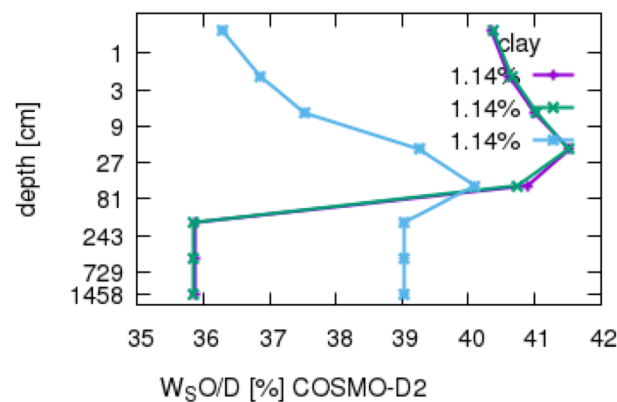
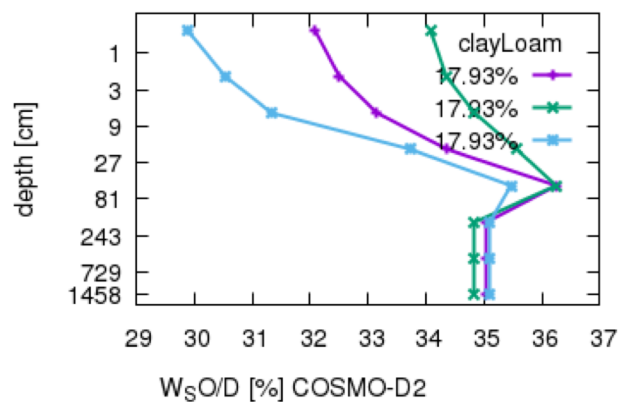
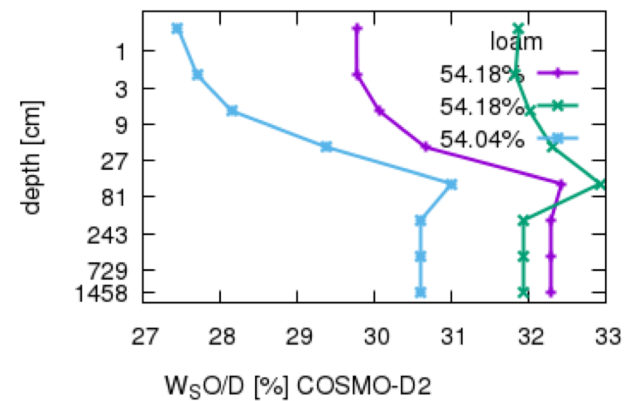
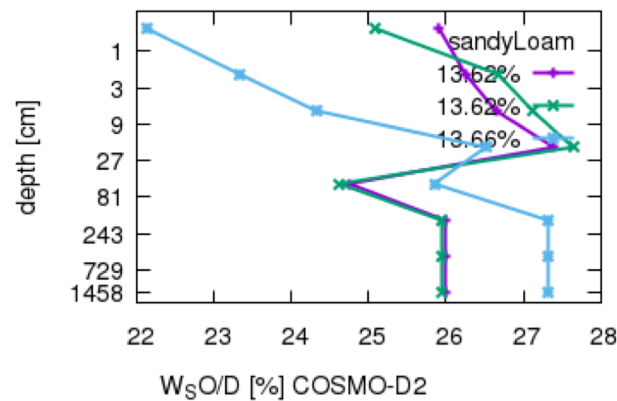
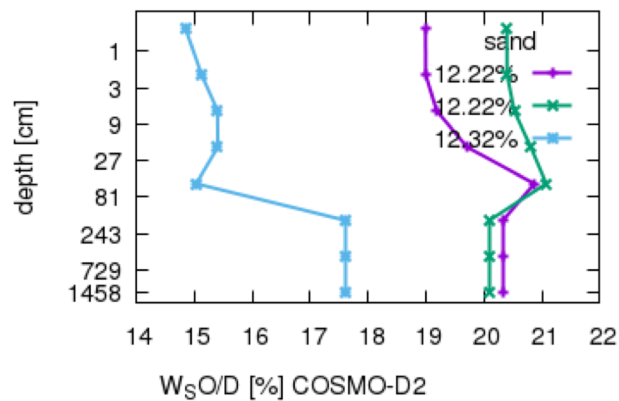


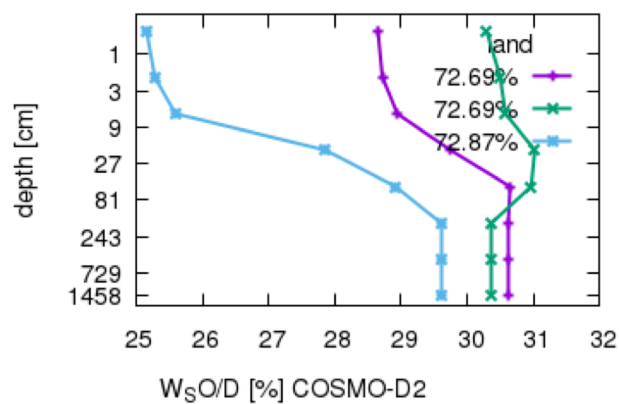
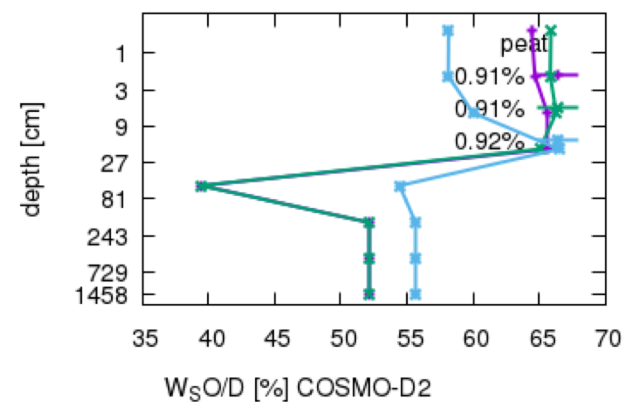
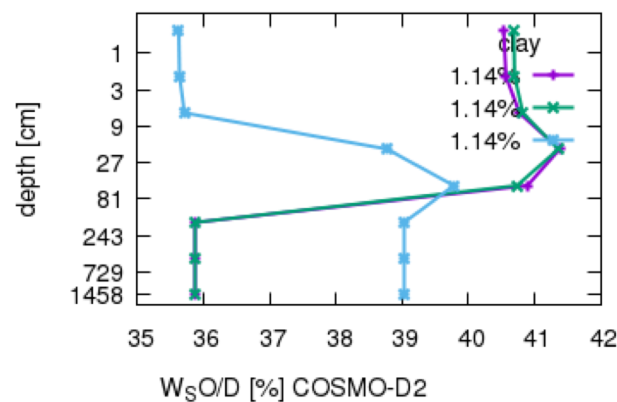
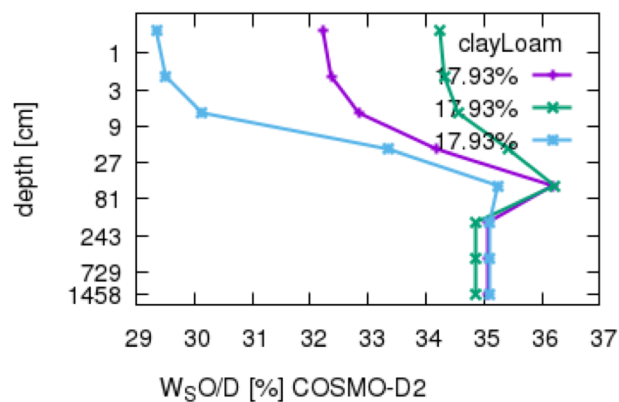
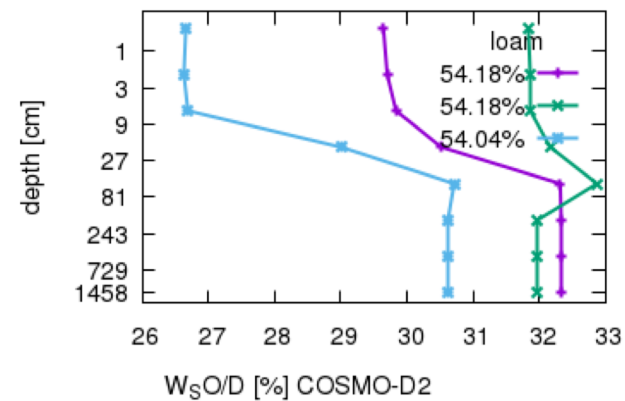
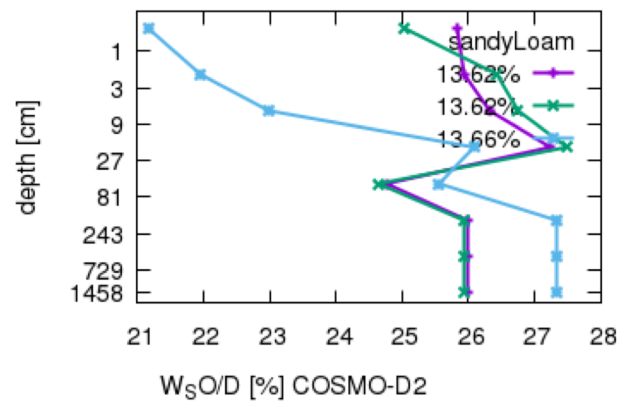
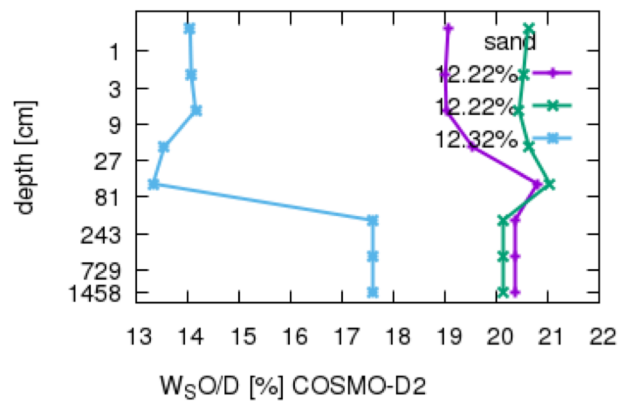
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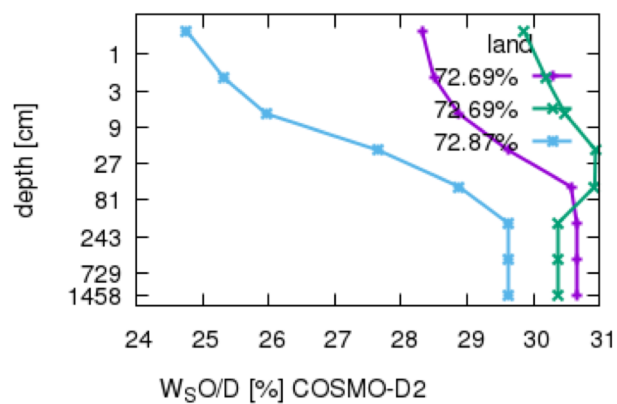
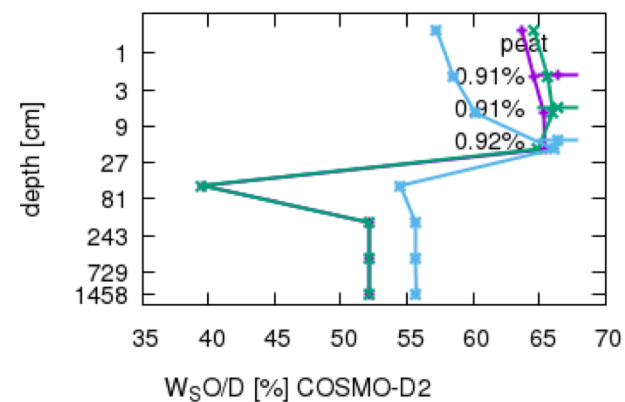
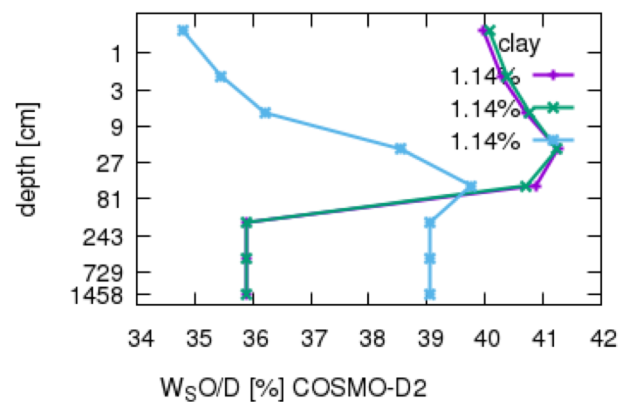
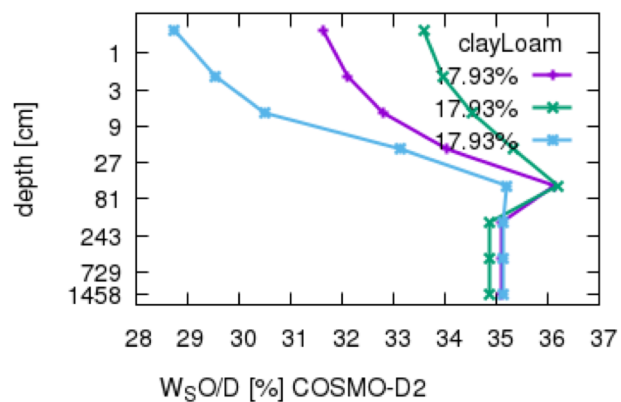
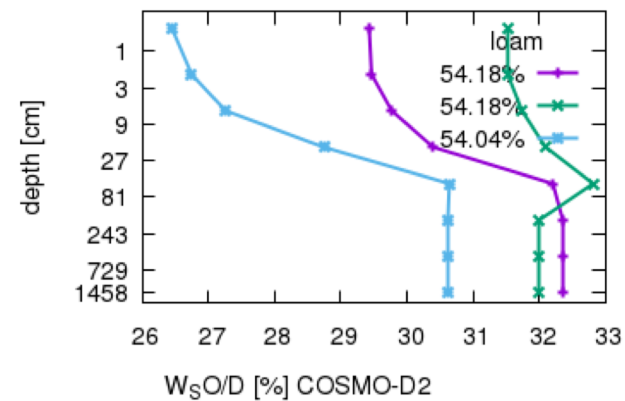
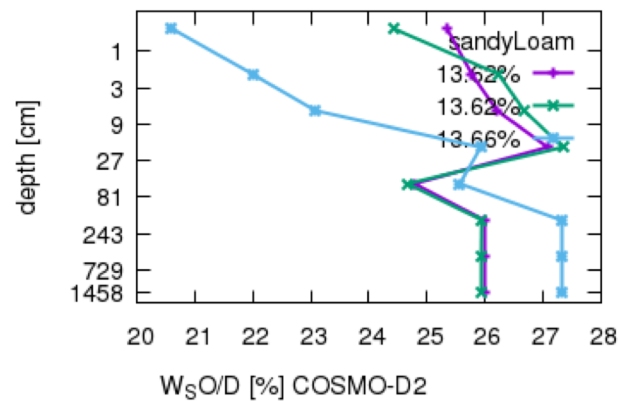
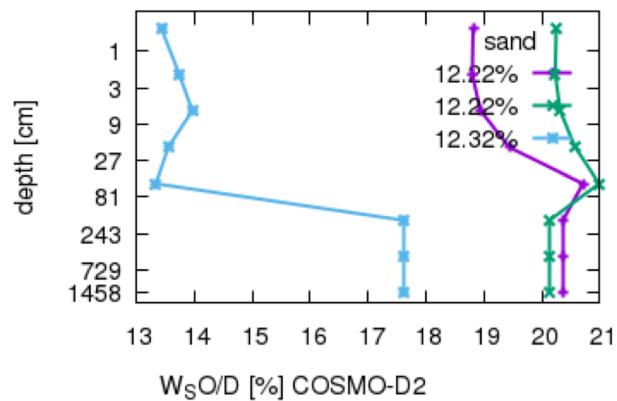




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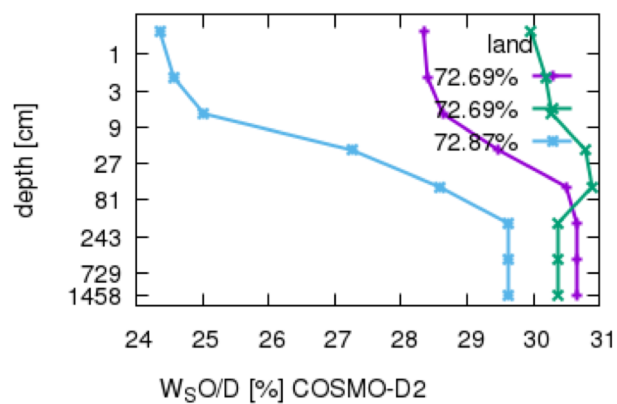
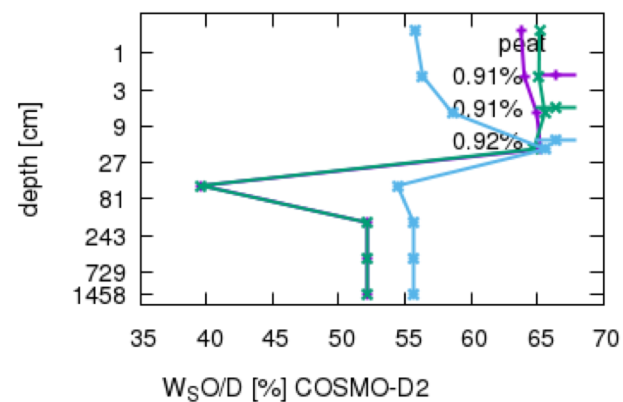
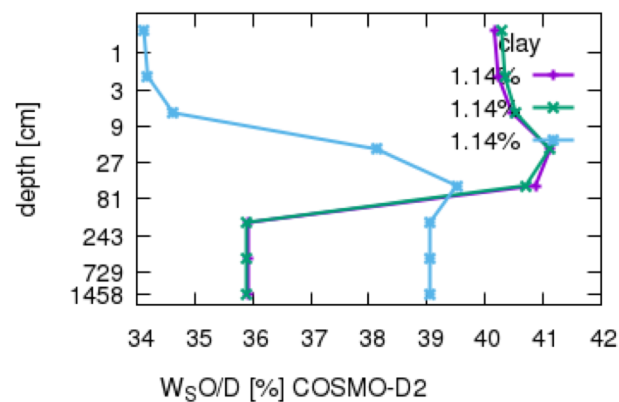
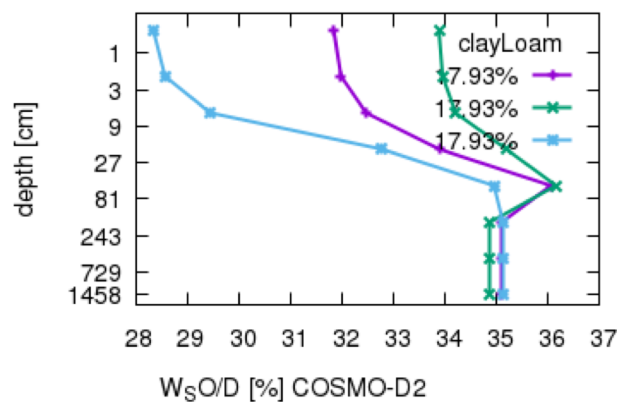
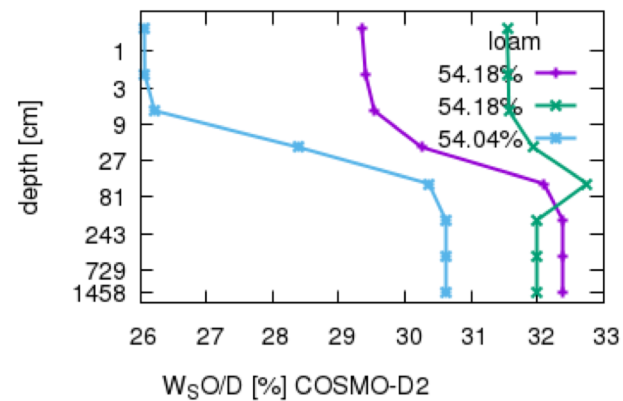
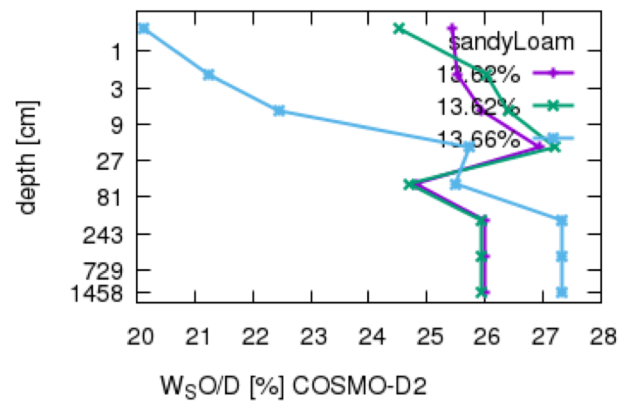
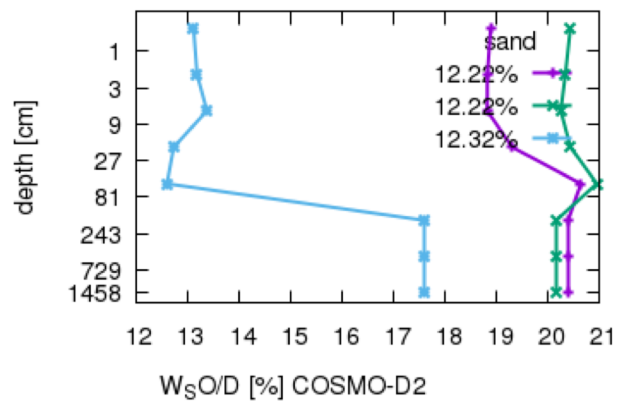
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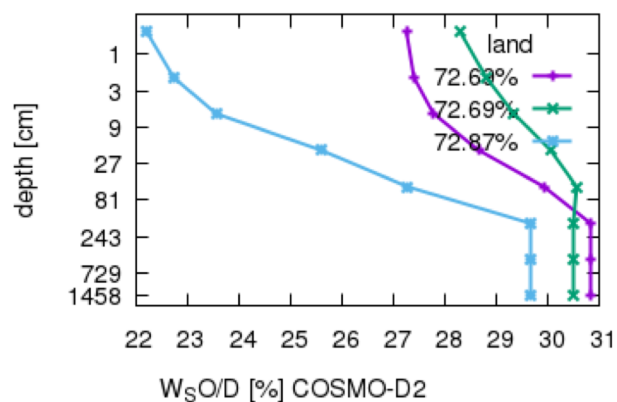
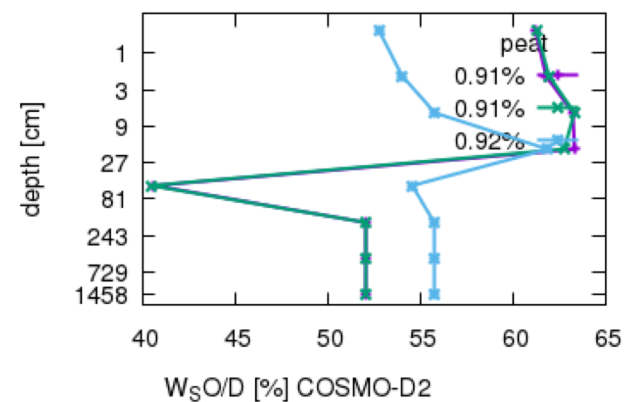
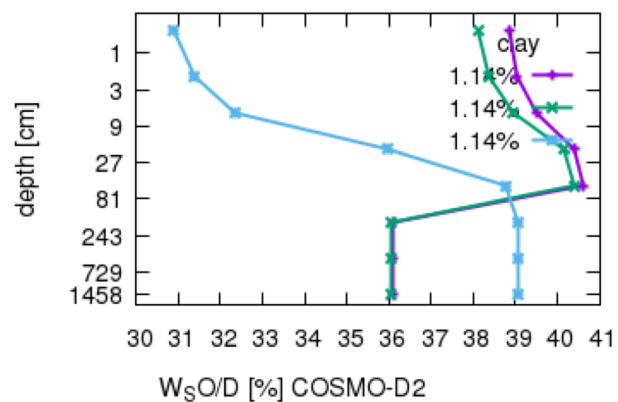
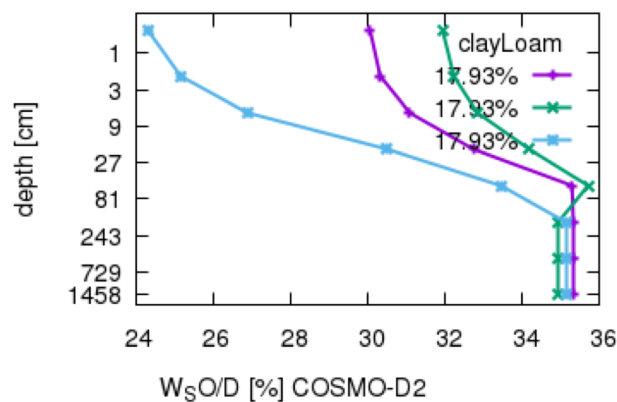
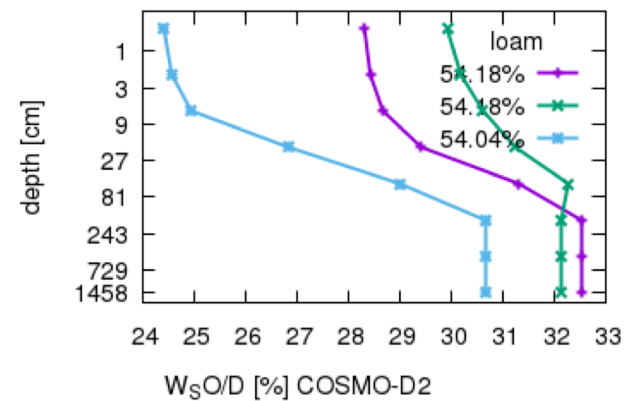
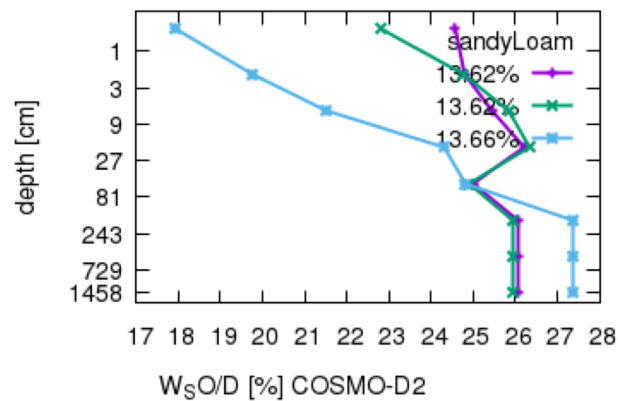
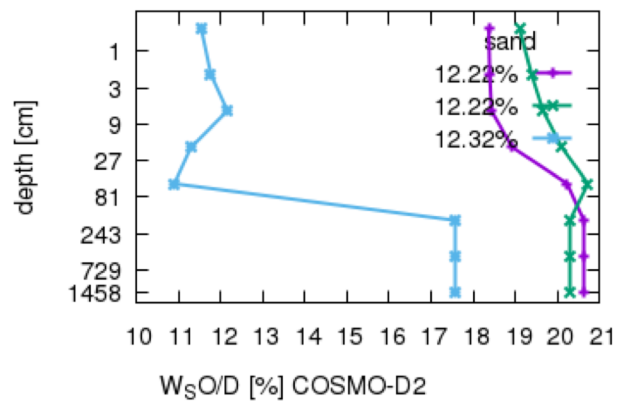


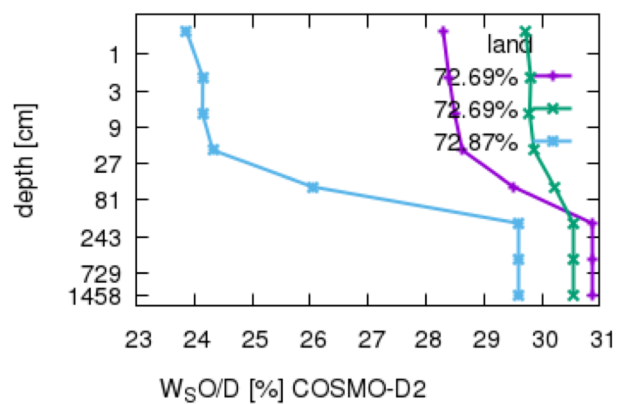
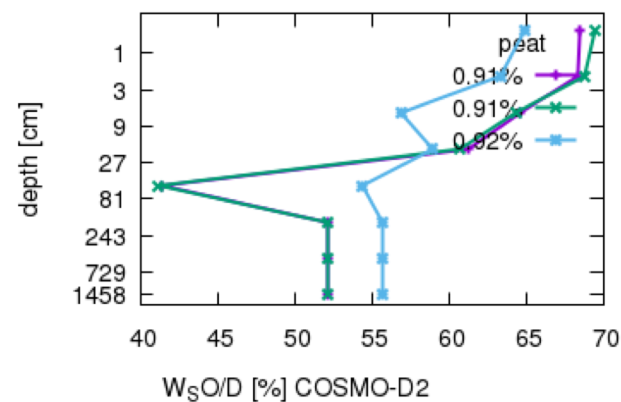
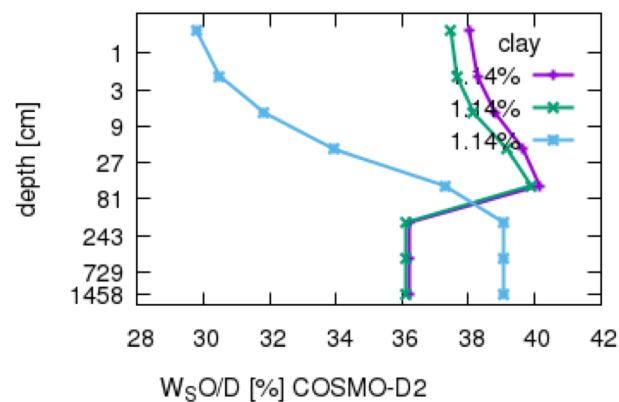
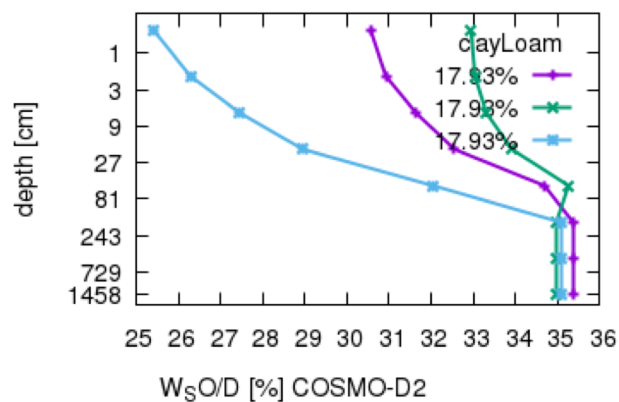
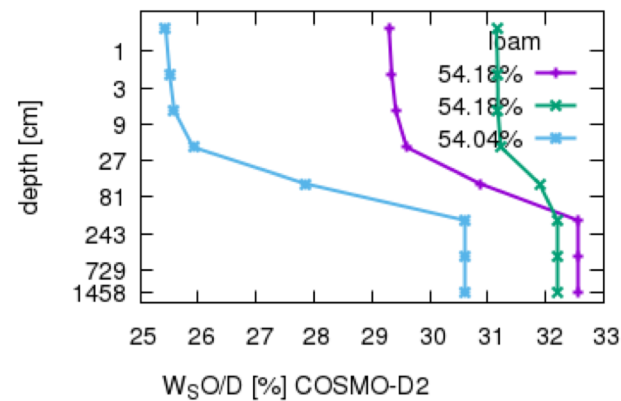
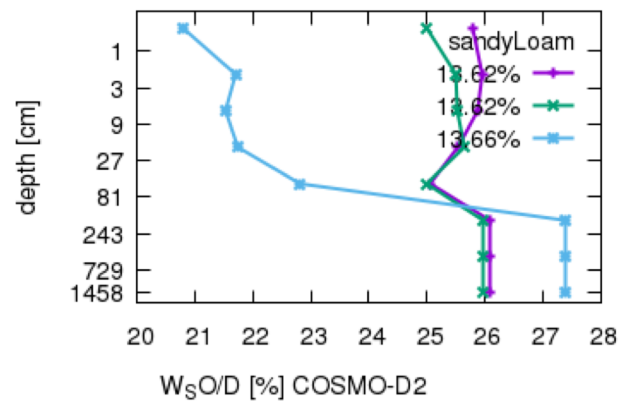
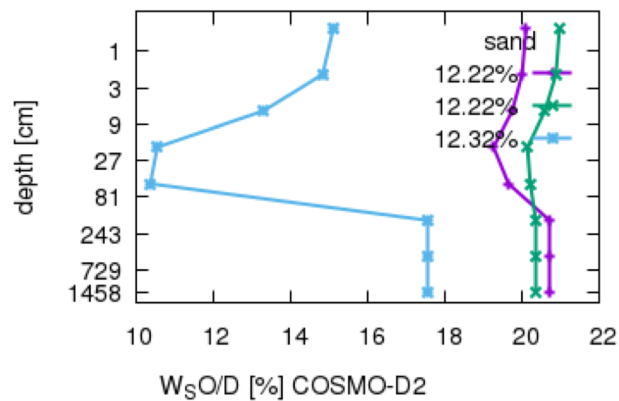
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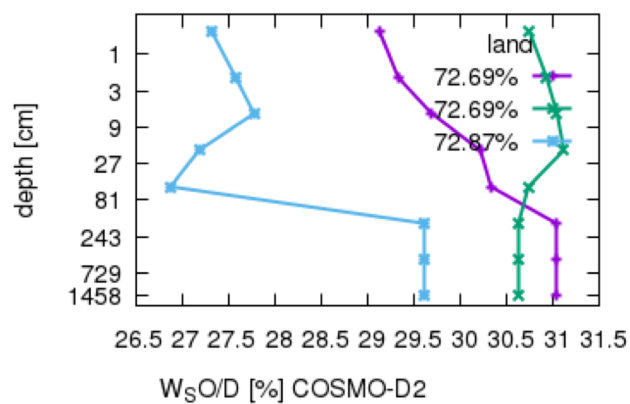
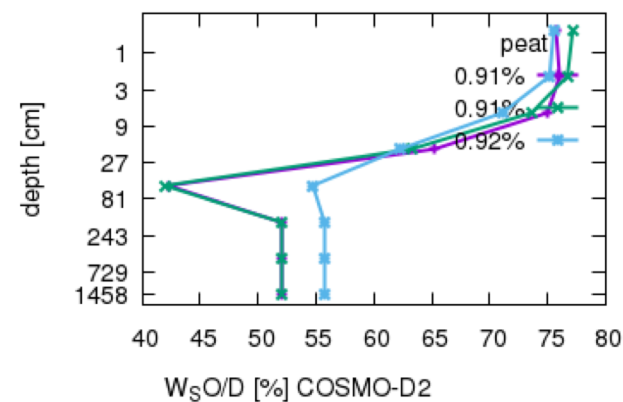
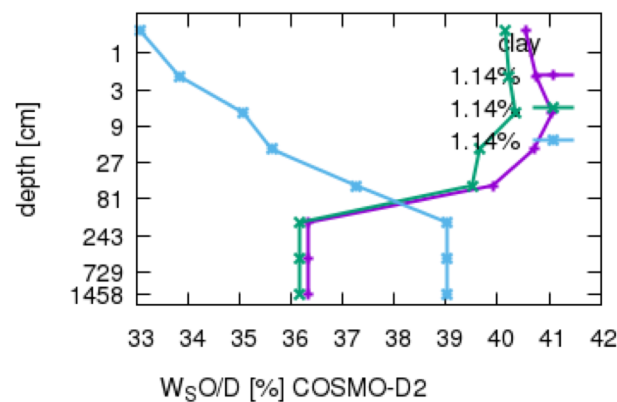
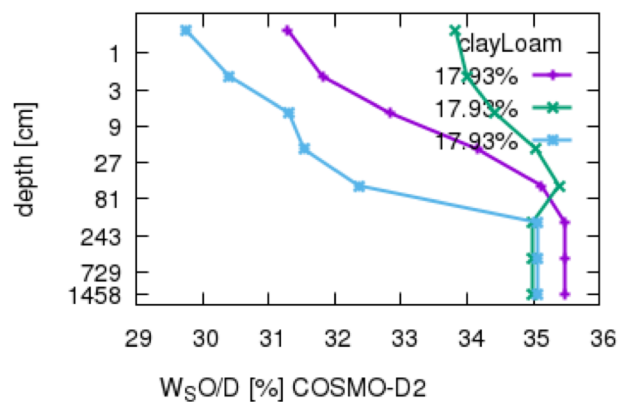
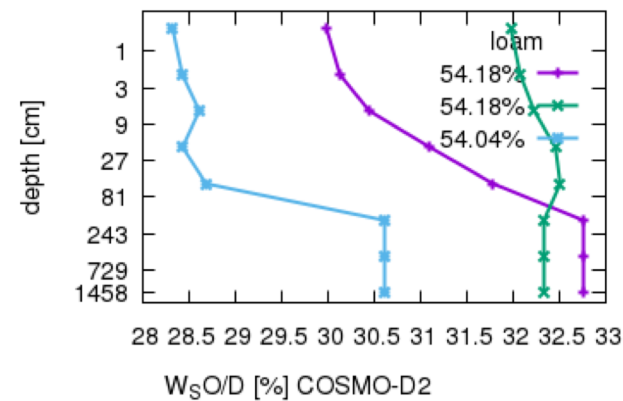
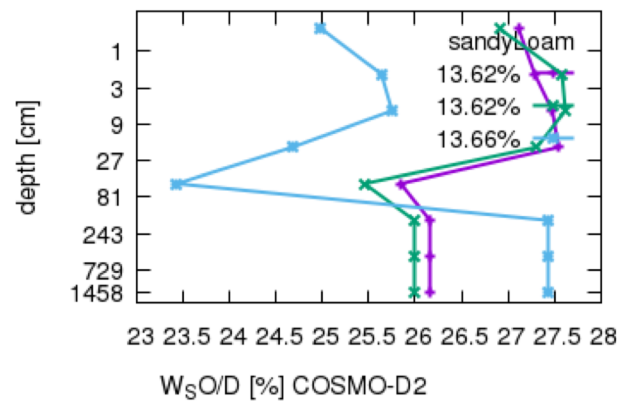
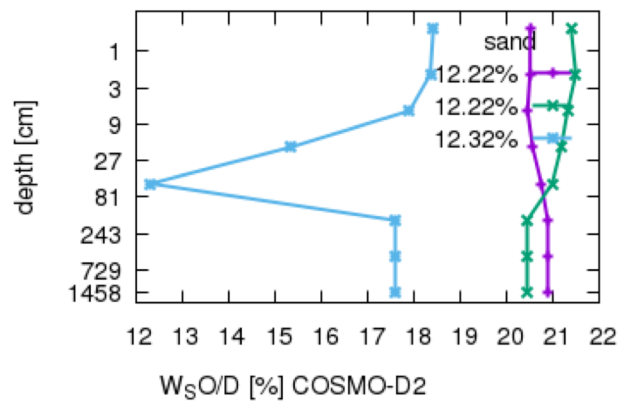
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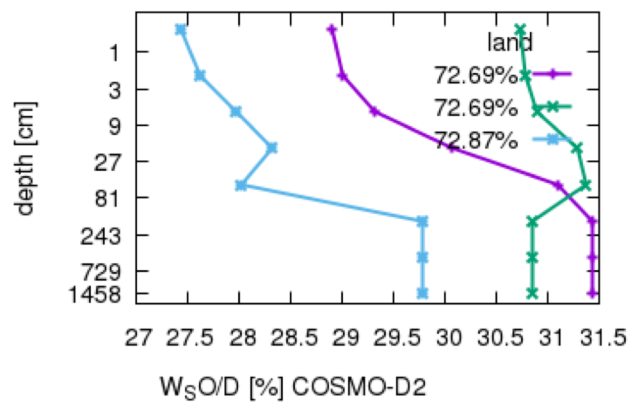
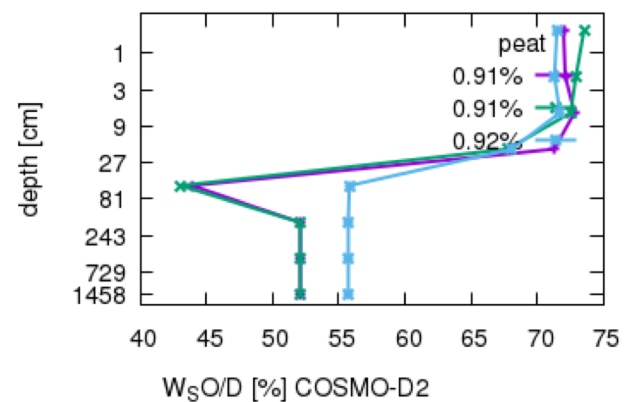
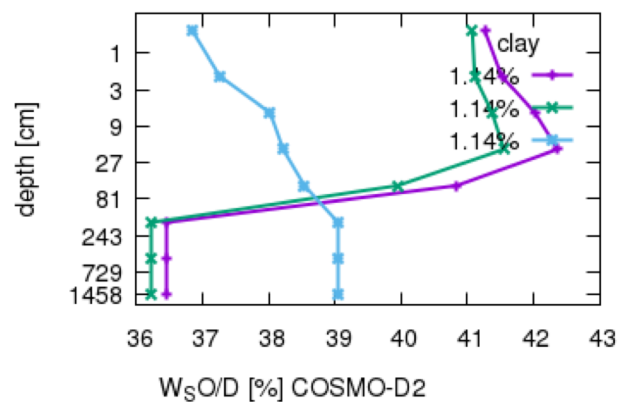
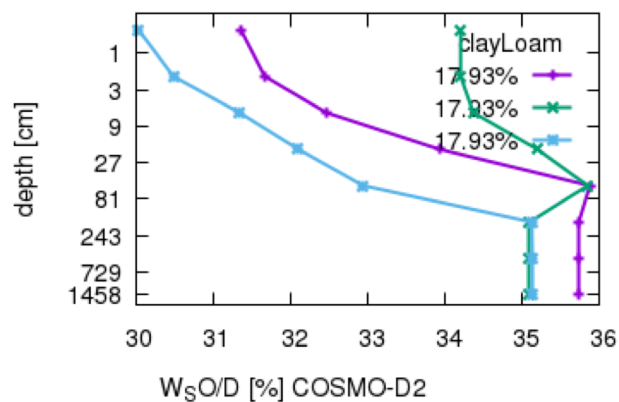
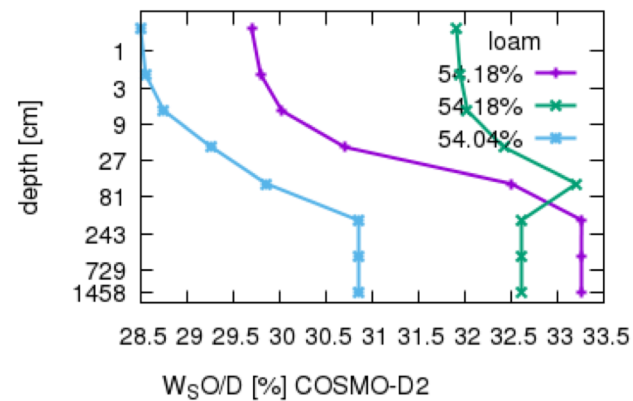
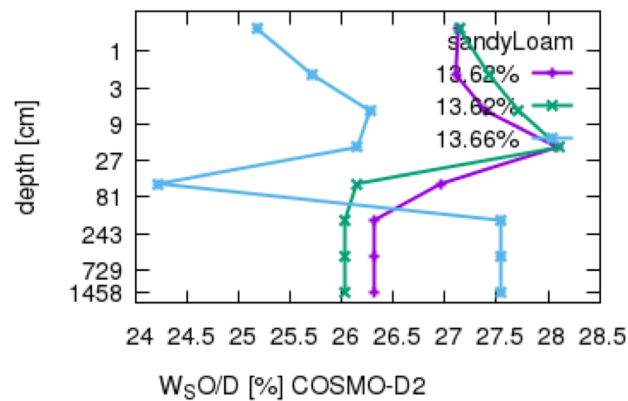
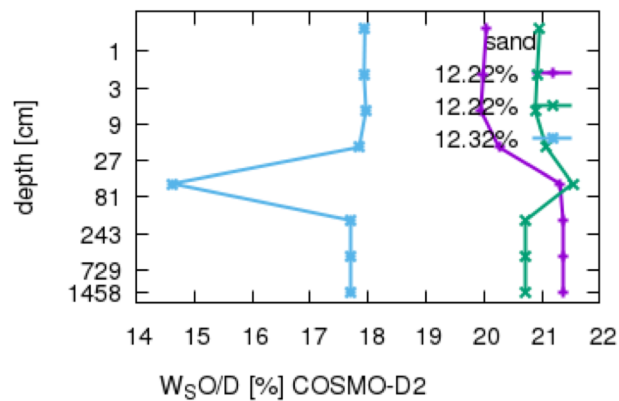




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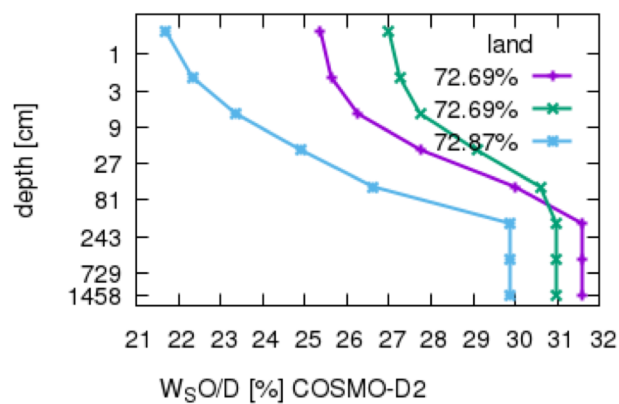
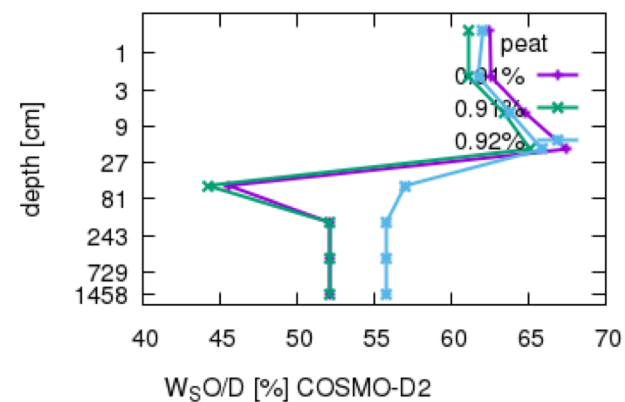
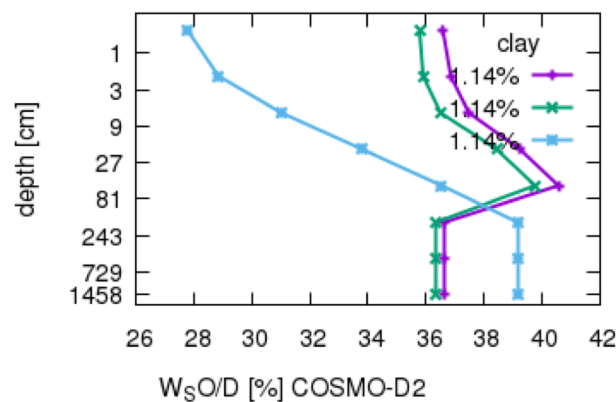
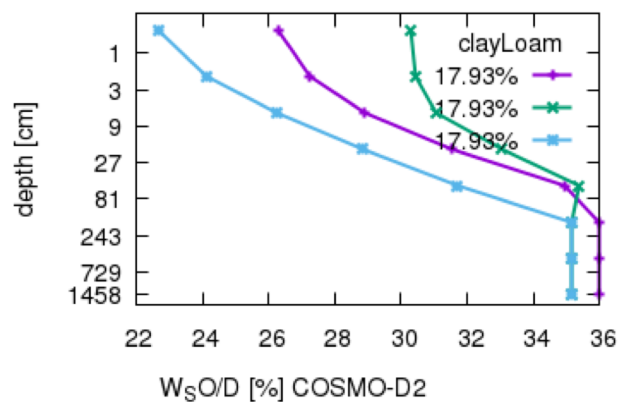
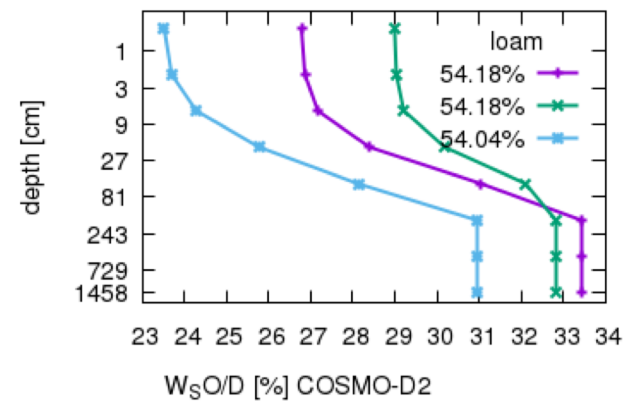
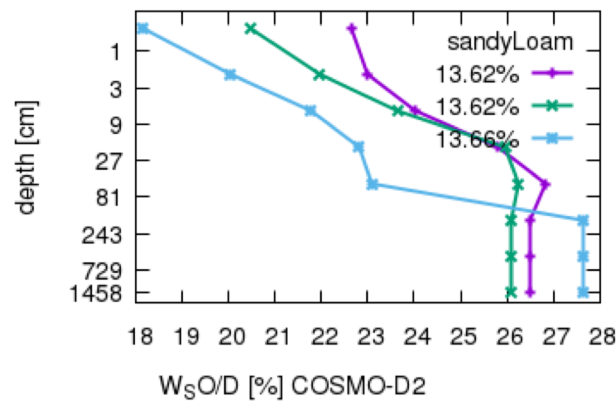
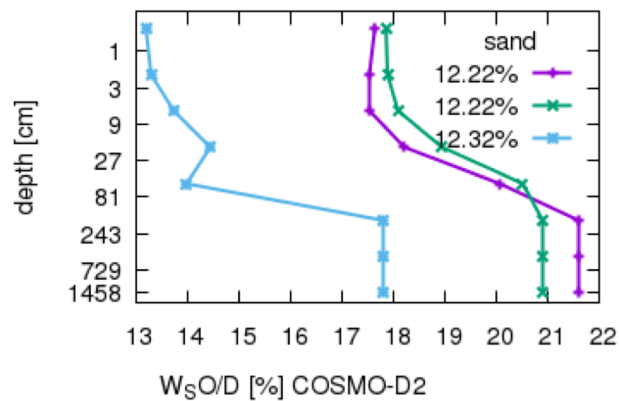
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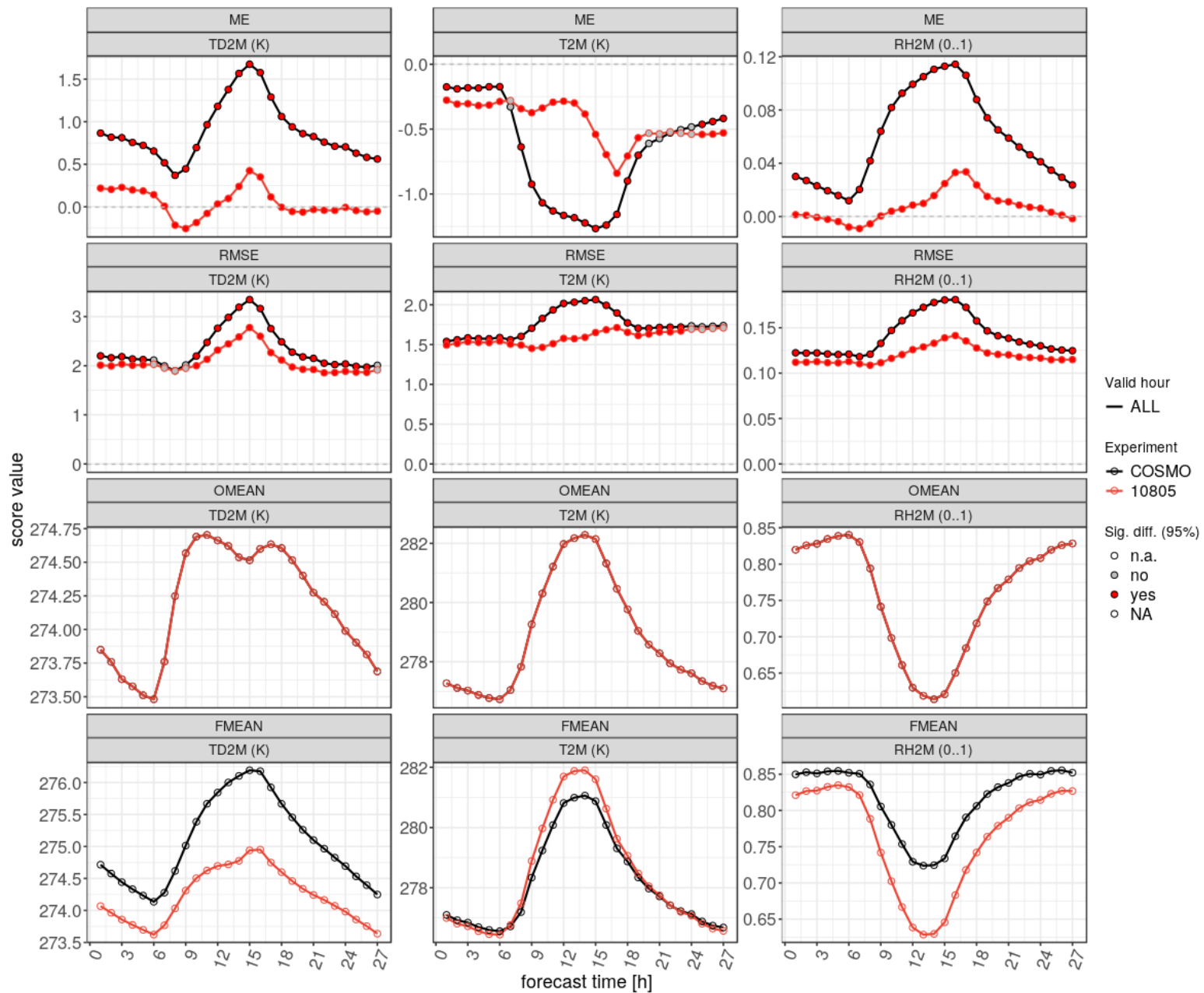


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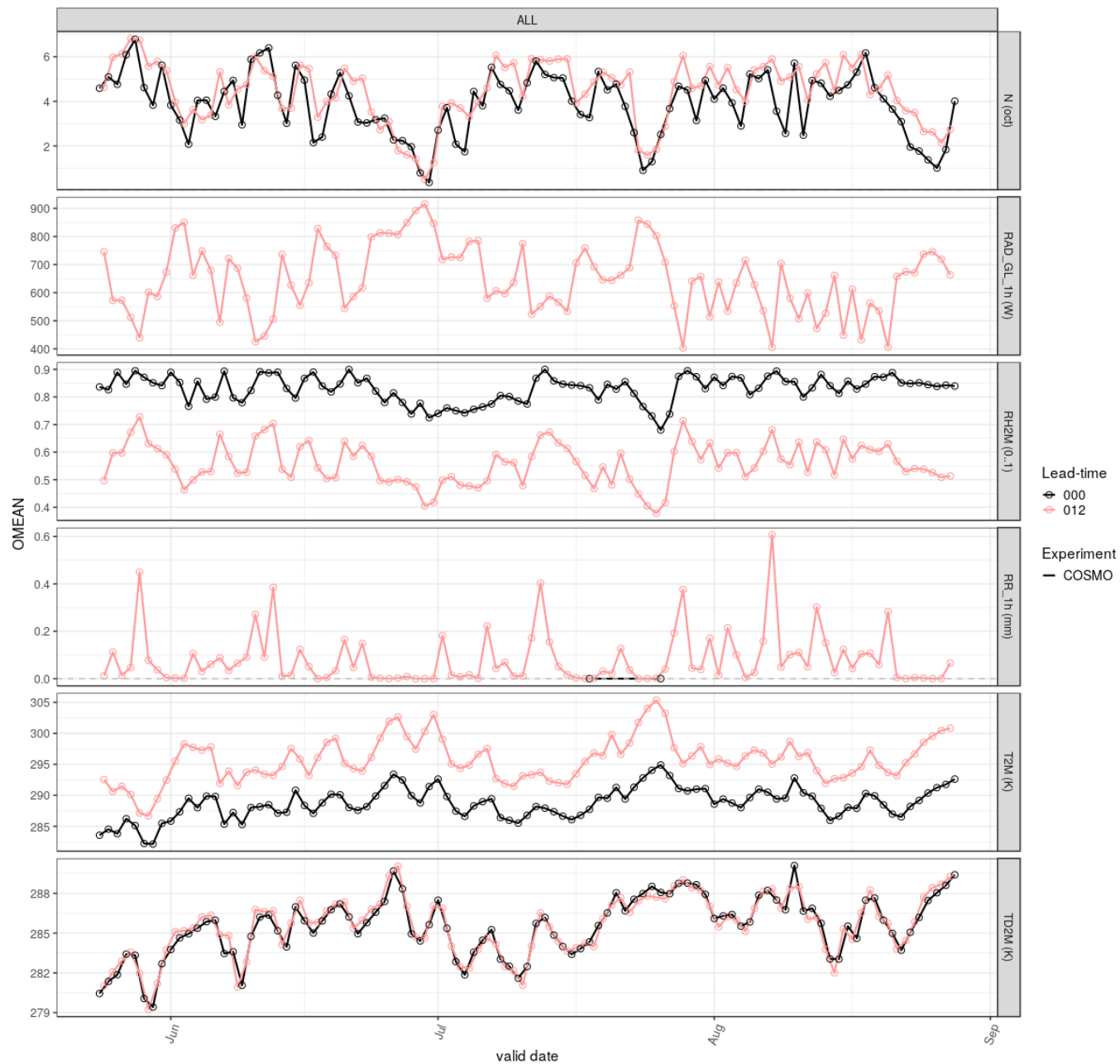


COSMO-D2 parallel suite

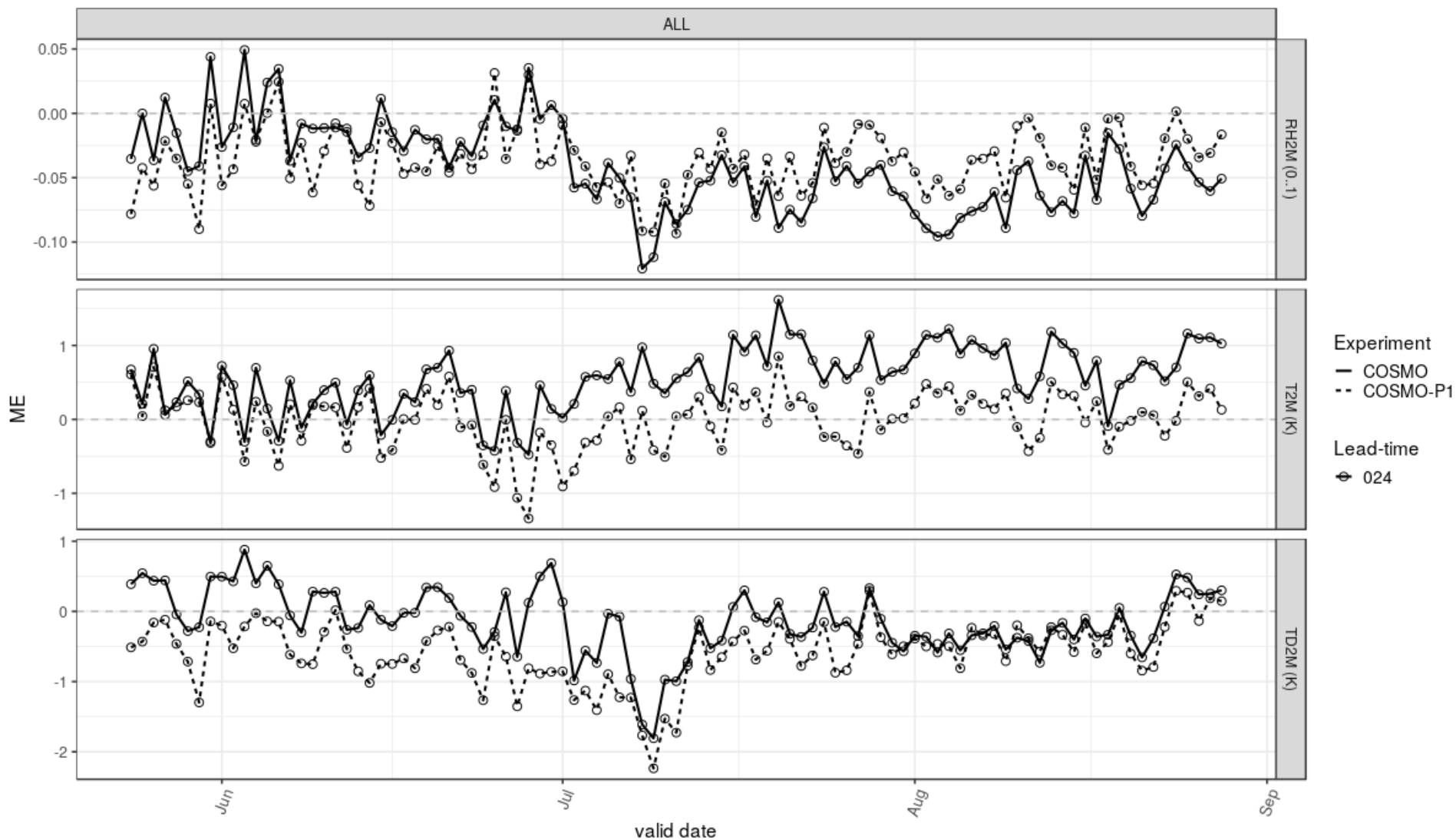
Simulation period: 23 May – 28 Aug. 2019 (about three months)

Namelists as in operational COSMO-D2, except for (in PHYCTL):

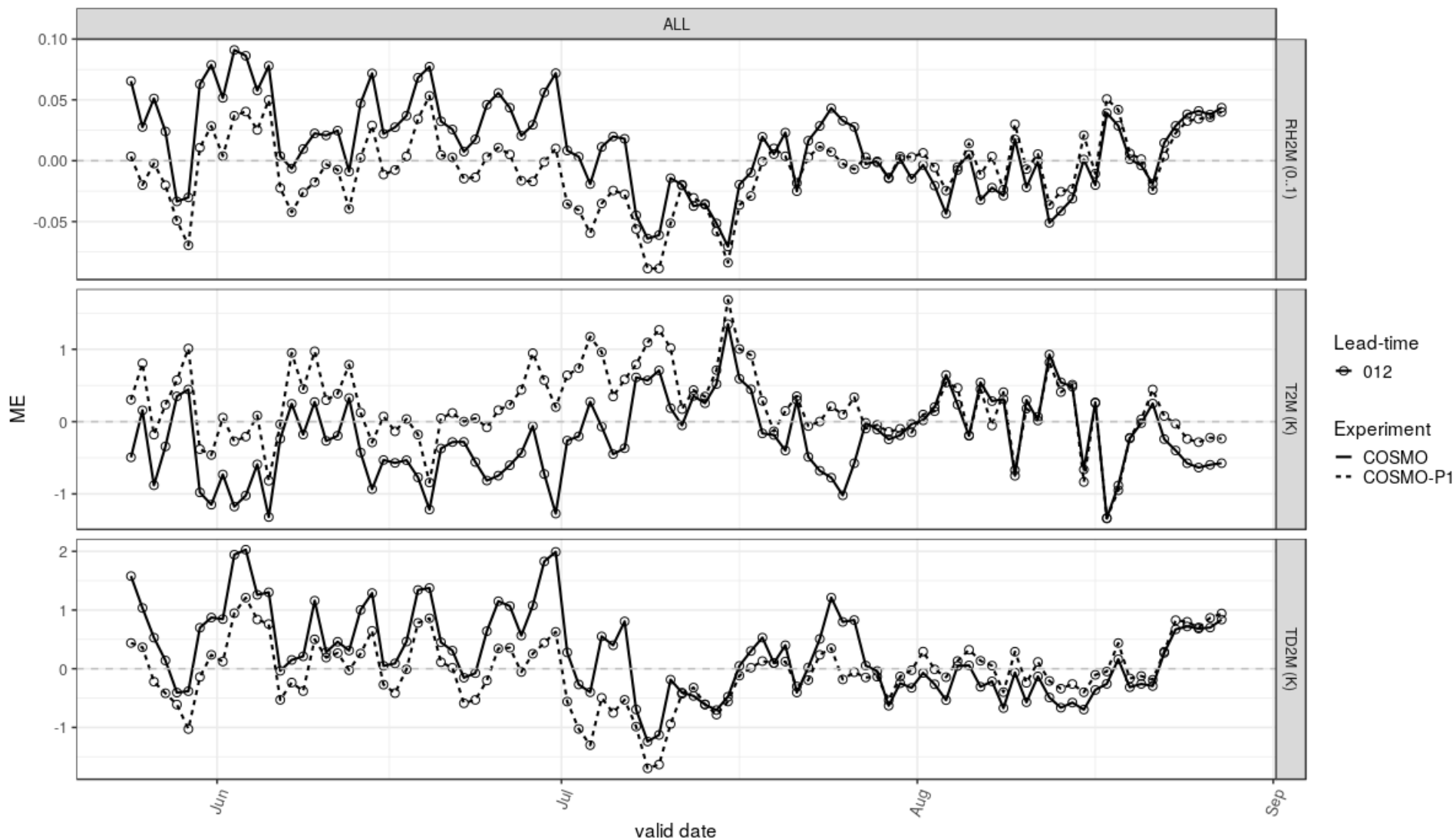
- `itype_evsl` = 4 : New bare soil evaporation
- `itype_root` = 2 : Exponential root profile
- `cwimax_ml` = 0.0005 : Interception reservoir activated
- `itype_heatcond` = 3 : Soil thermal conductivity dependent on moisture
- `itype_canopy` = 2 : Skin temperature



2019.05.23-22UTC - 2019.08.28-09UTC

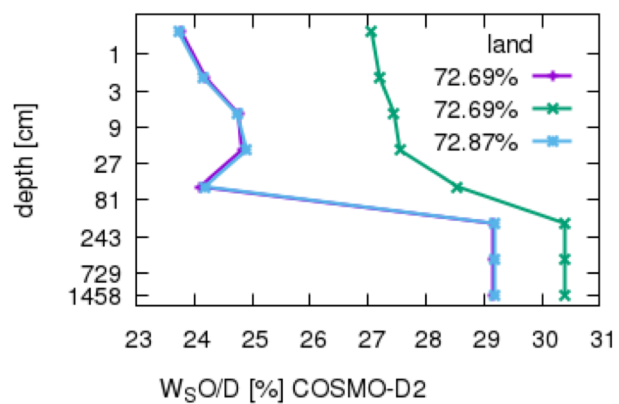
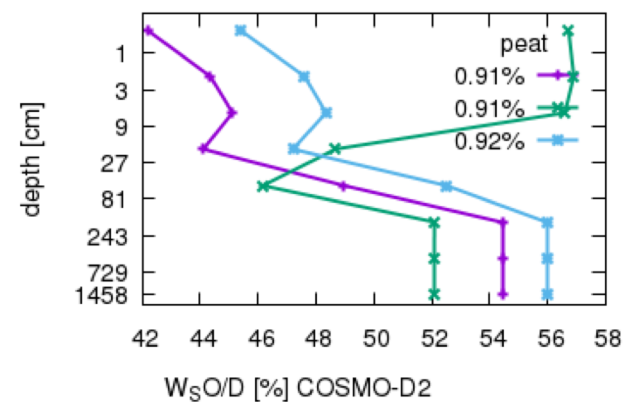
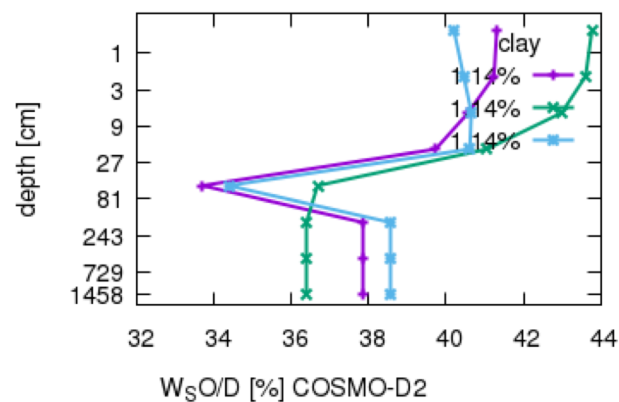
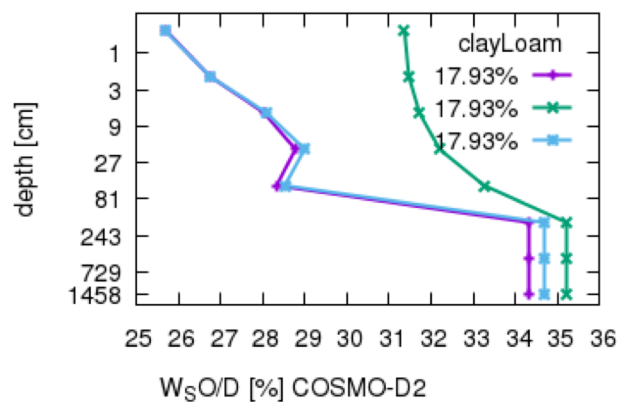
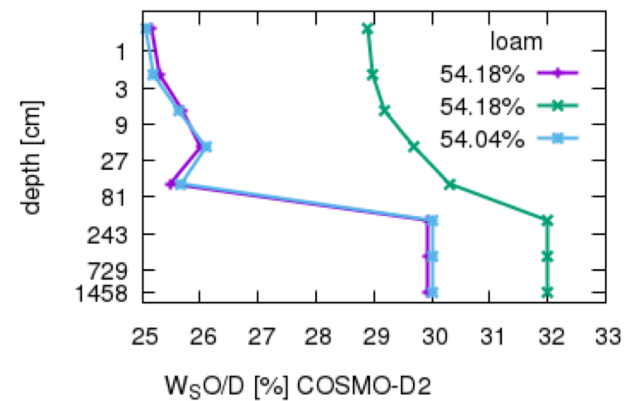
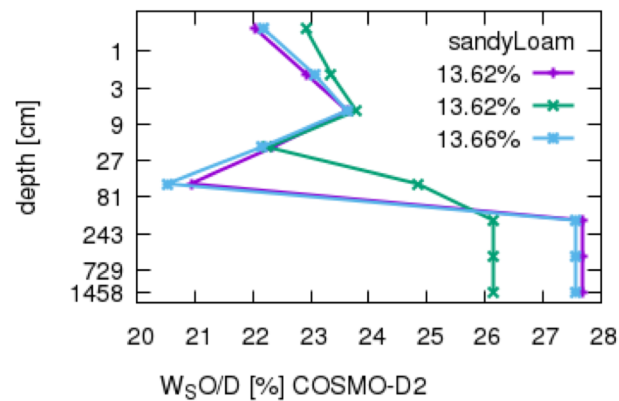
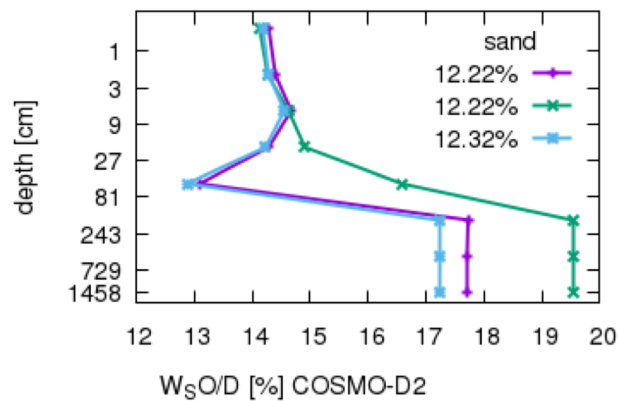


2019.05.23-22UTC - 2019.08.28-09UTC



Spin-up of the soil water content:

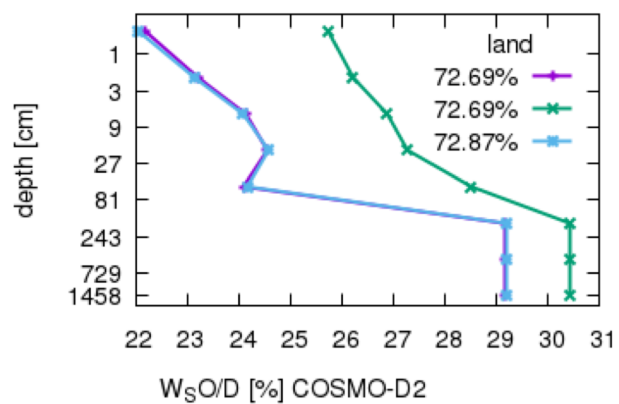
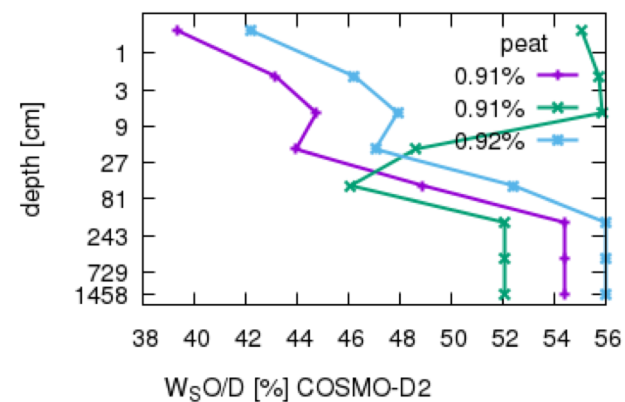
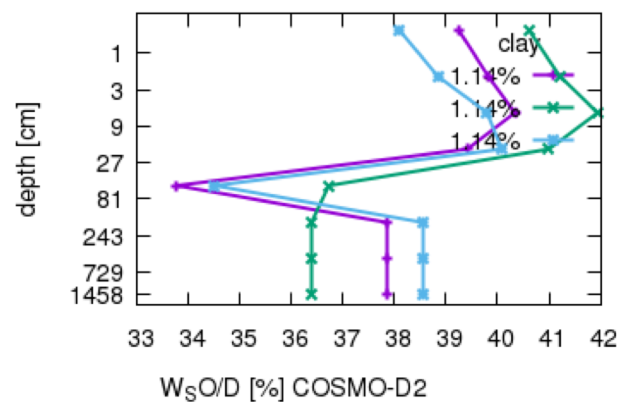
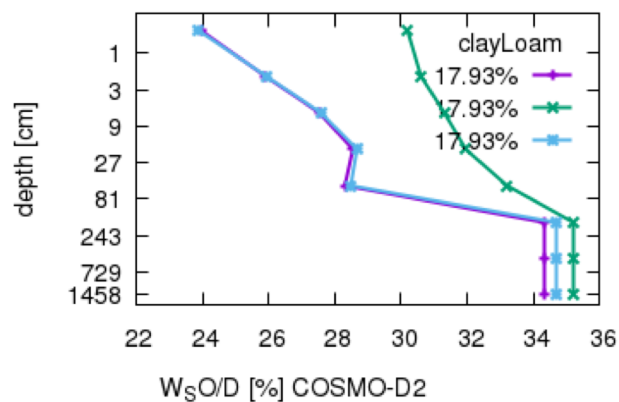
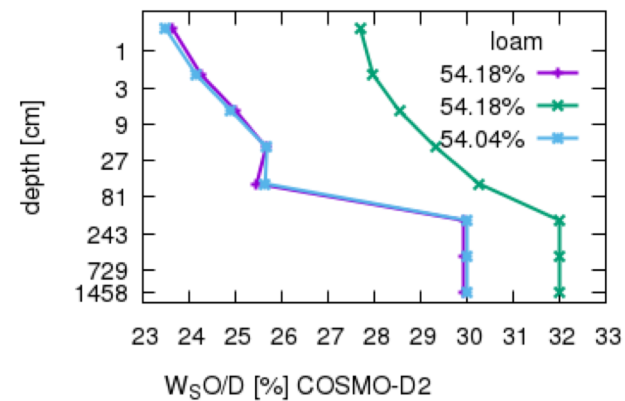
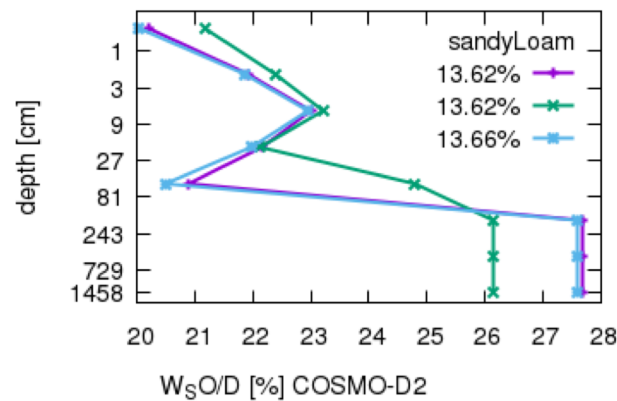
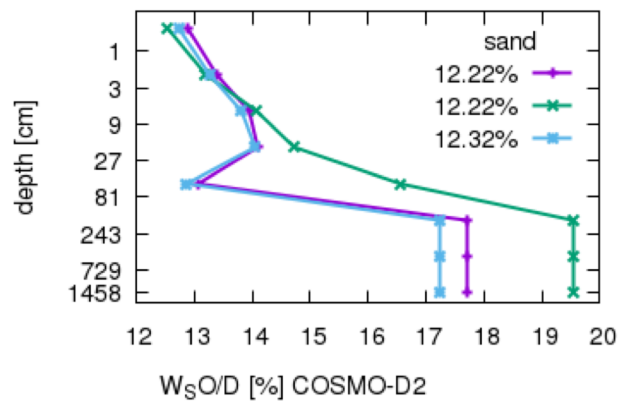
During the dry season a problem ...!

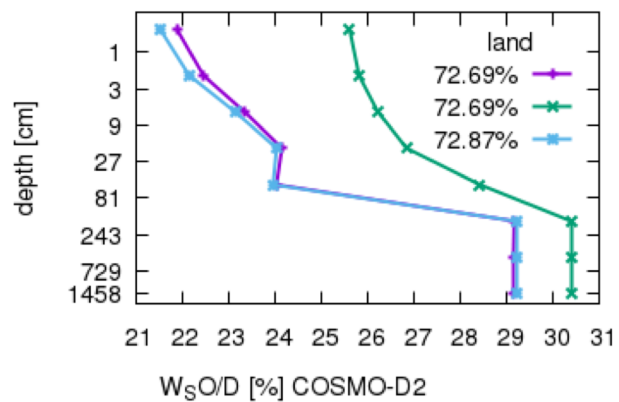
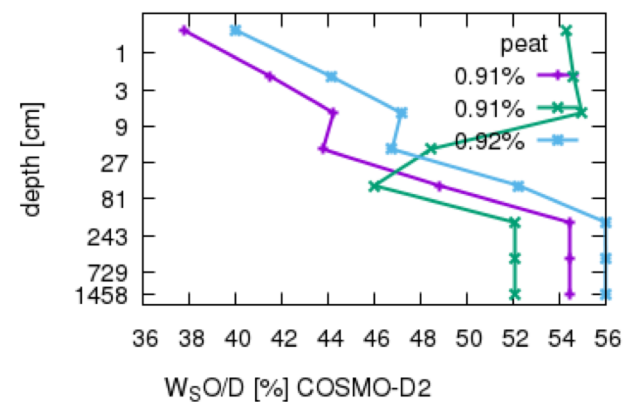
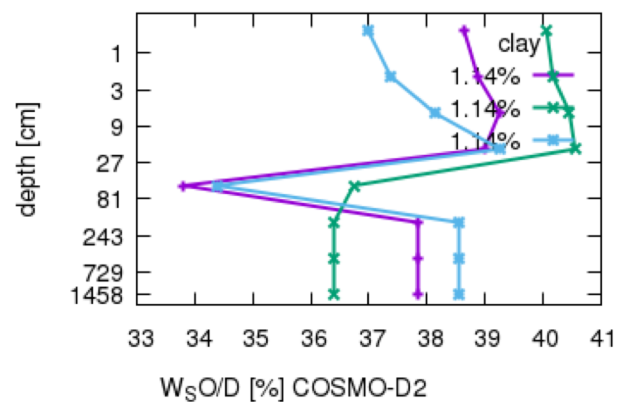
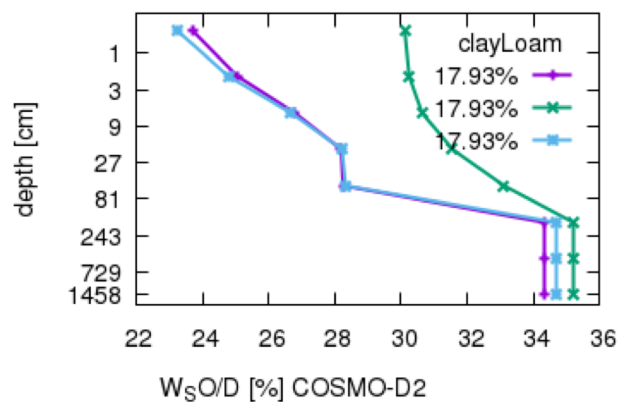
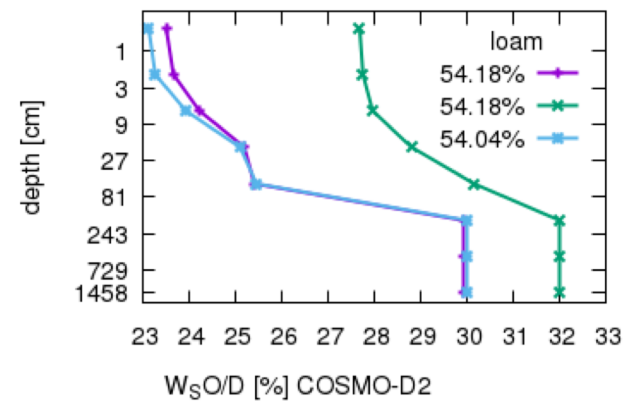
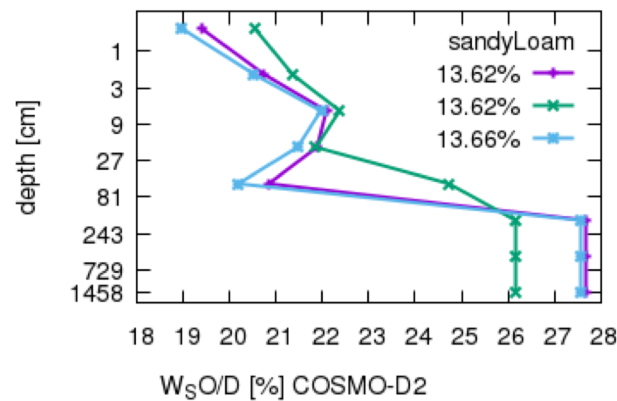
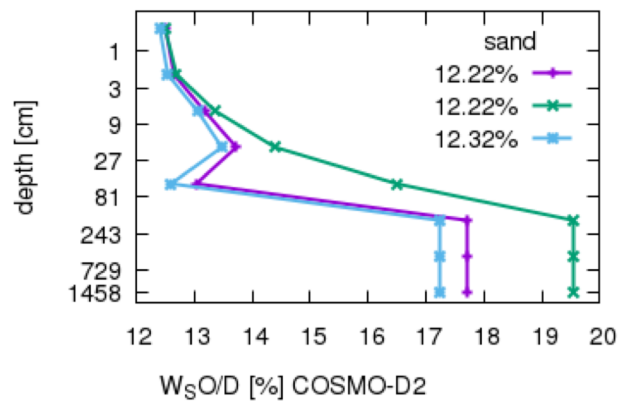


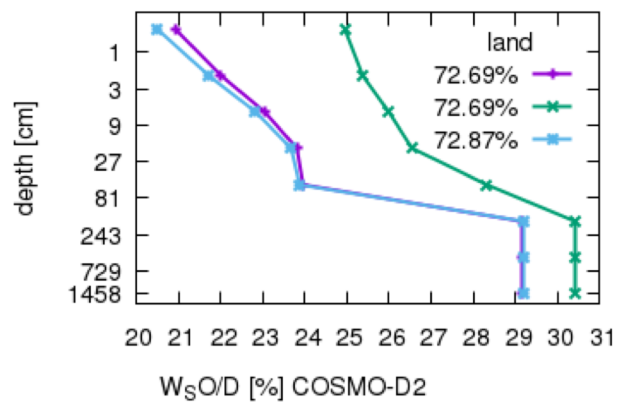
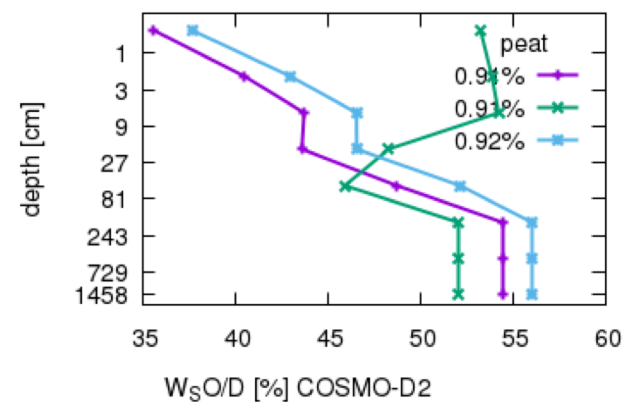
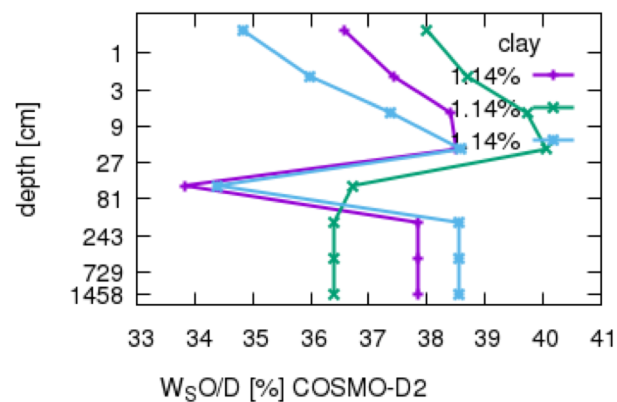
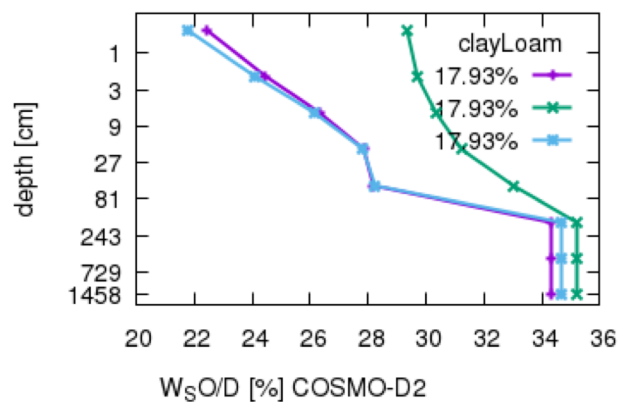
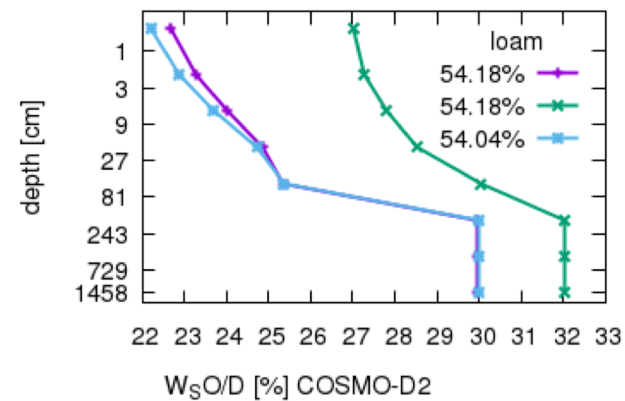
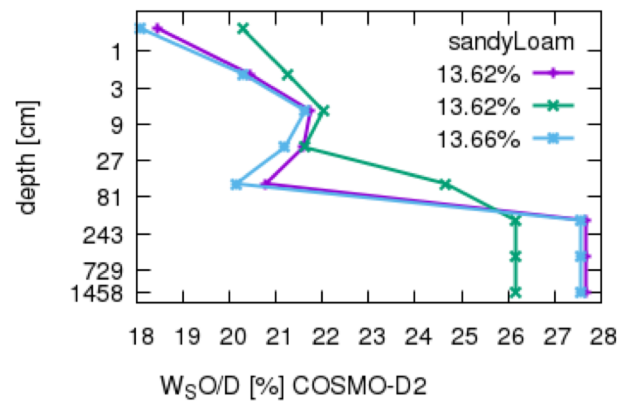
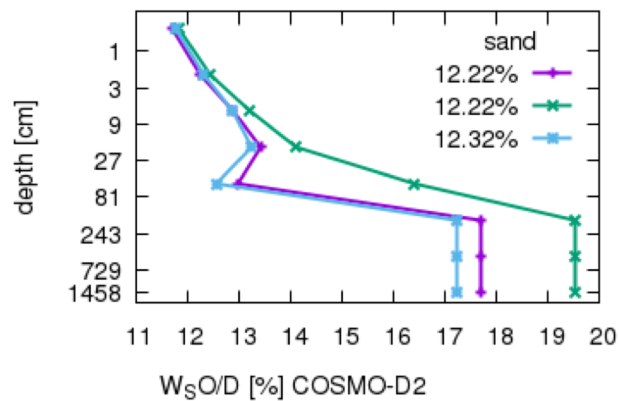
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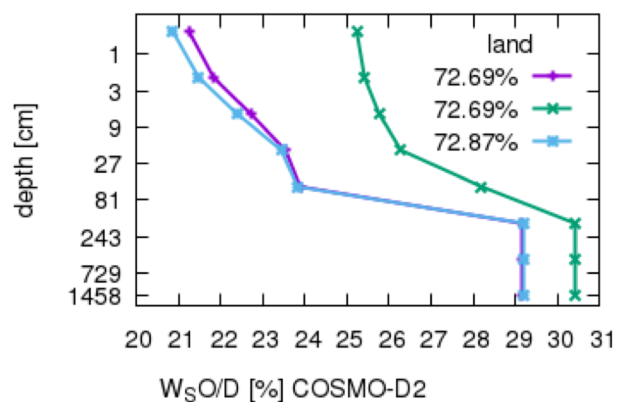
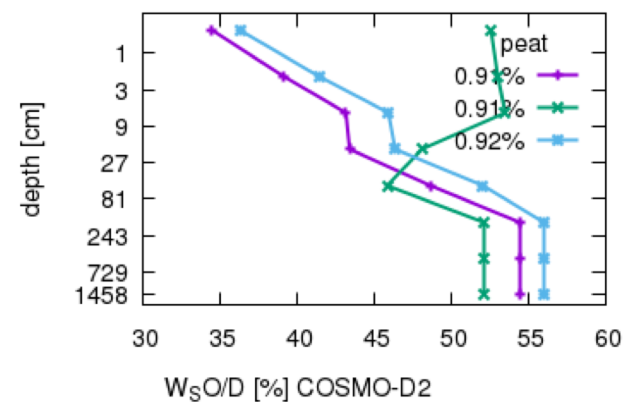
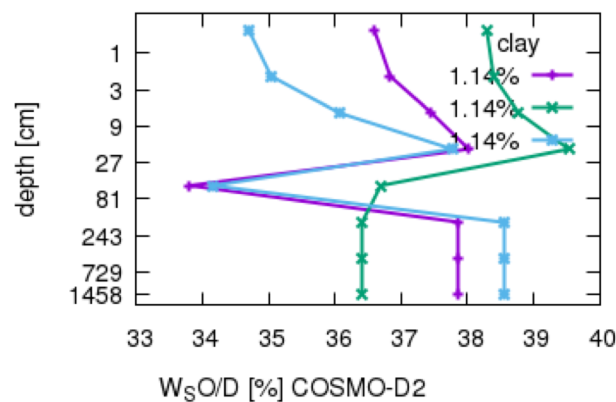
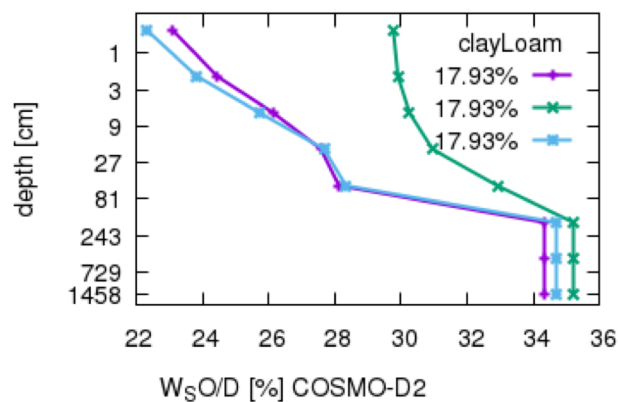
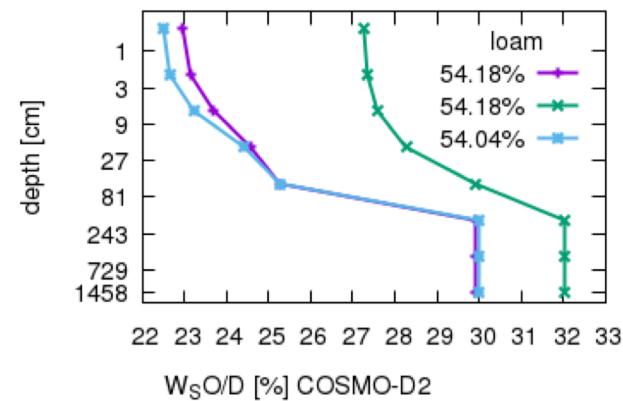
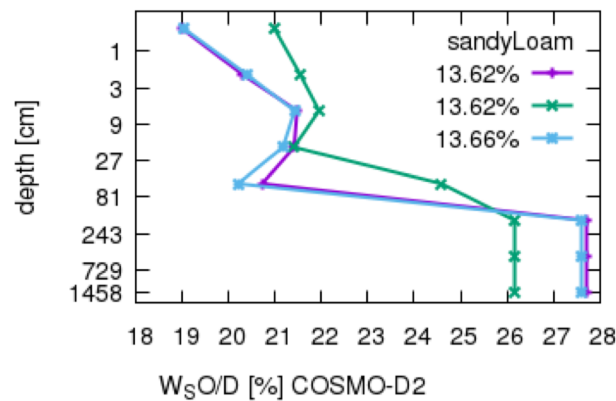
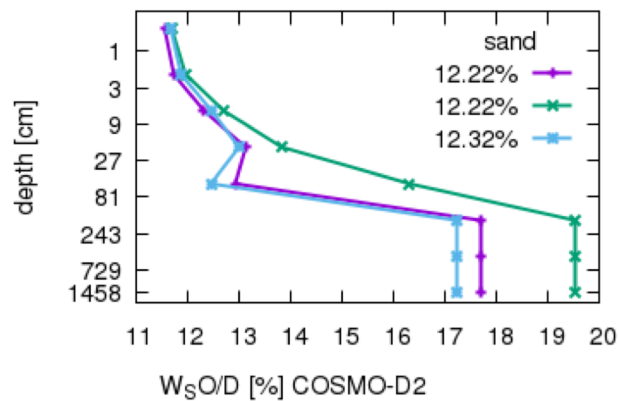


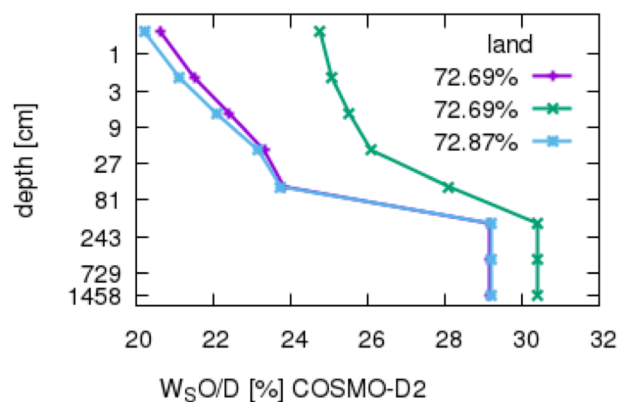
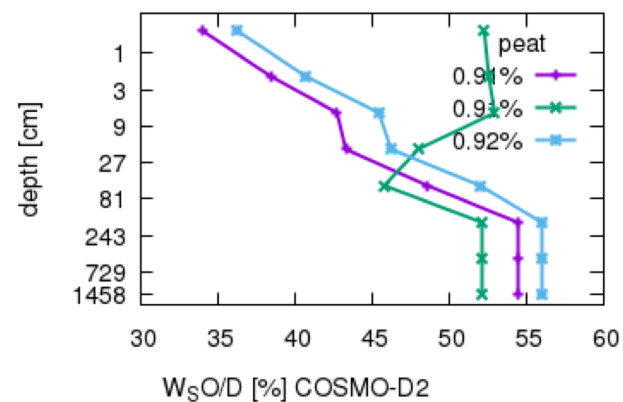
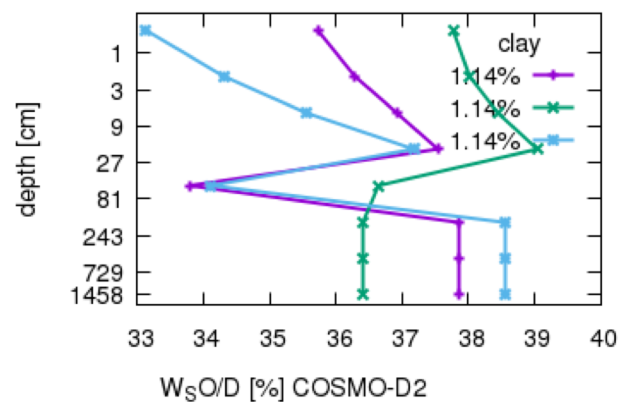
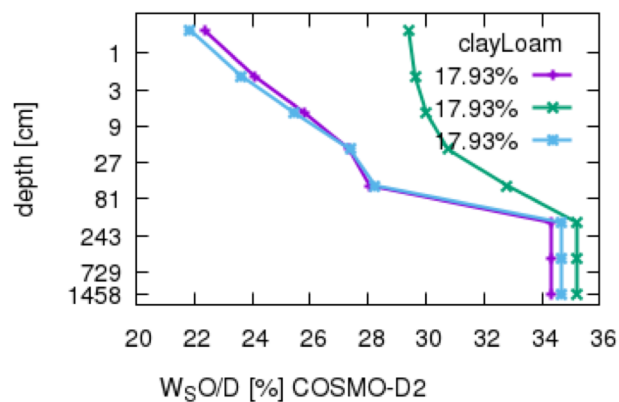
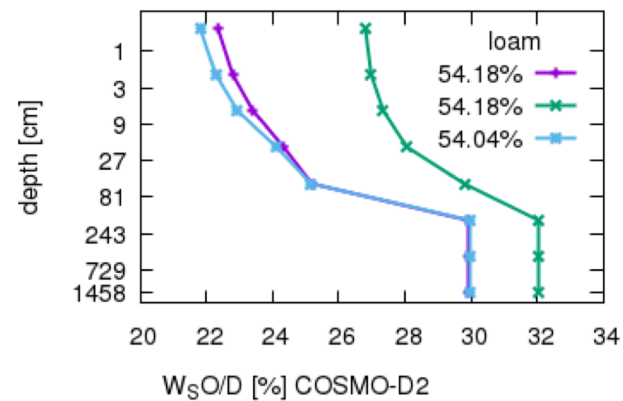
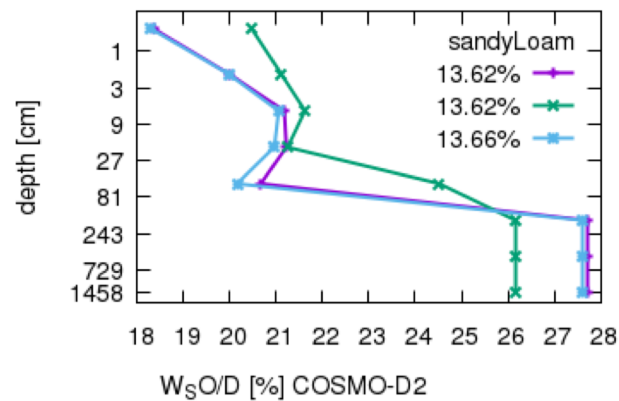
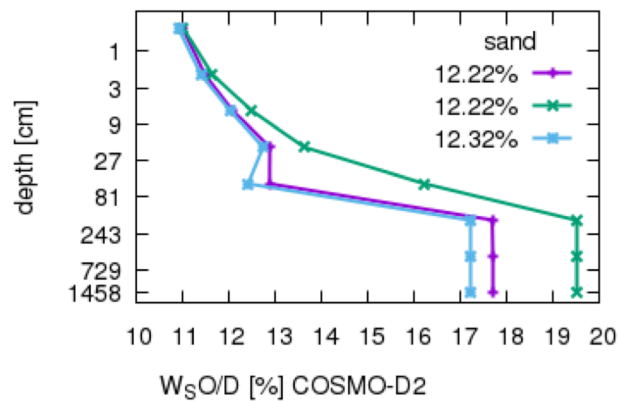


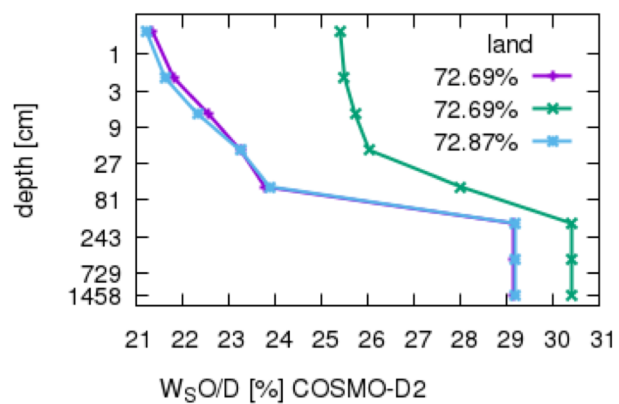
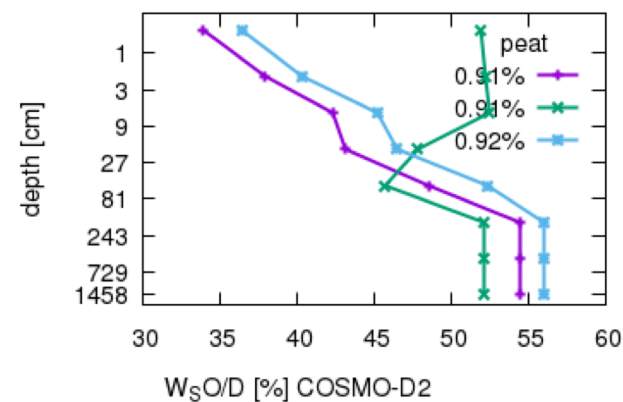
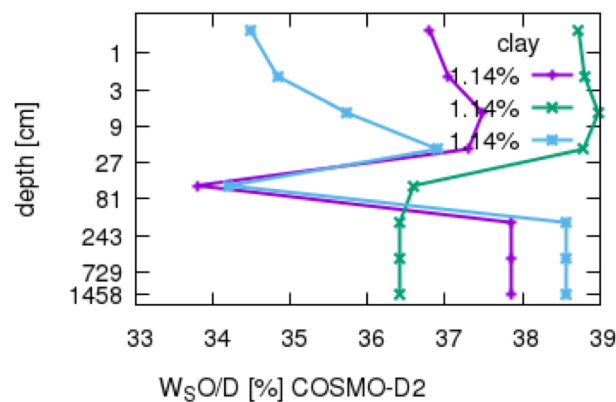
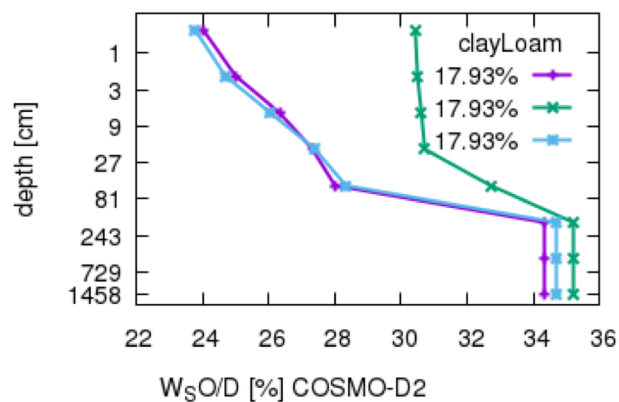
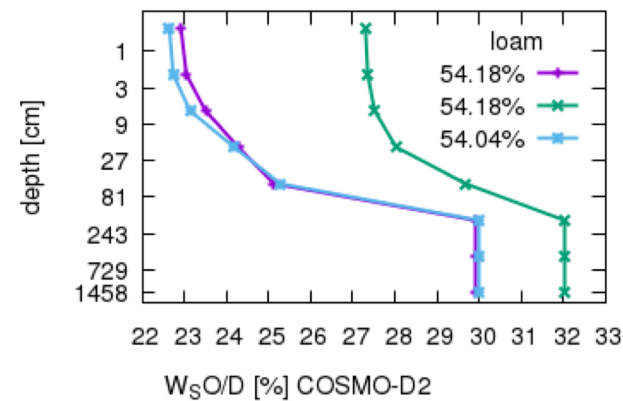
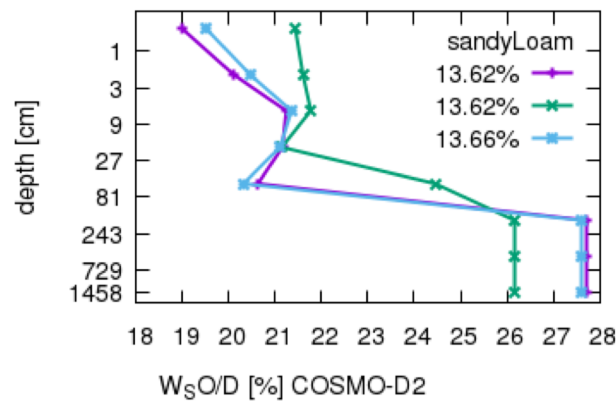
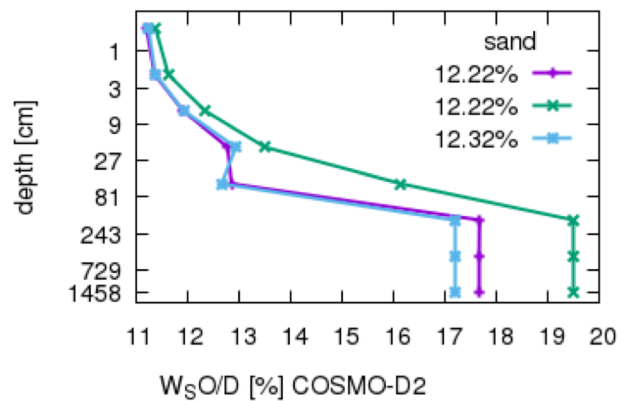
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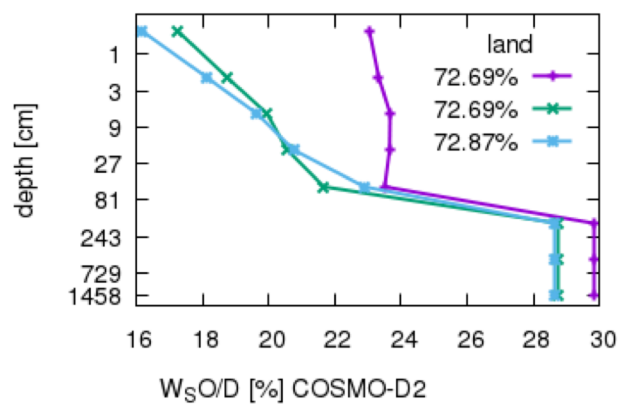
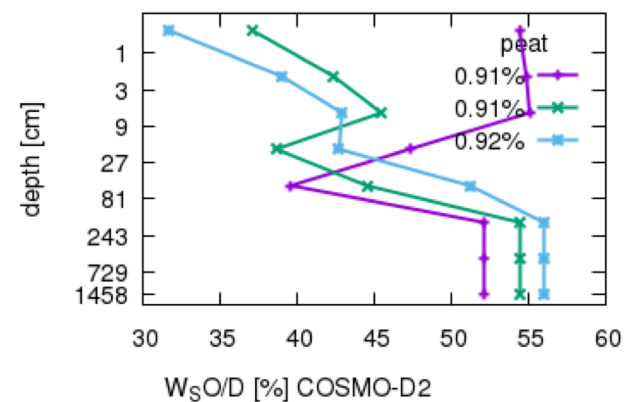
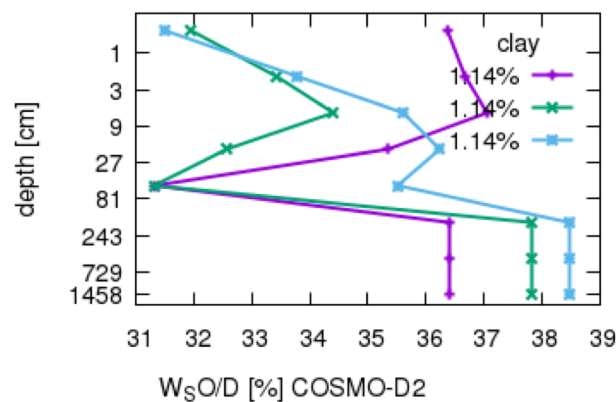
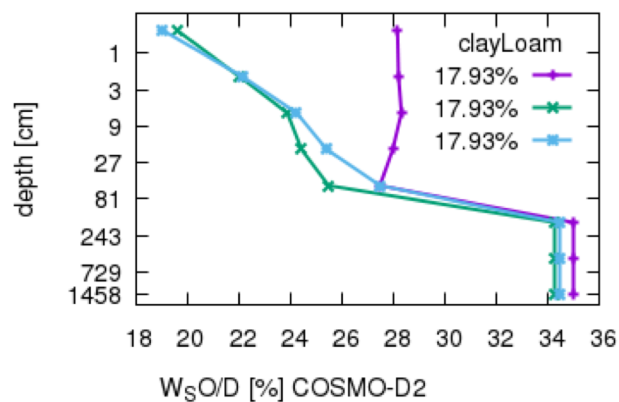
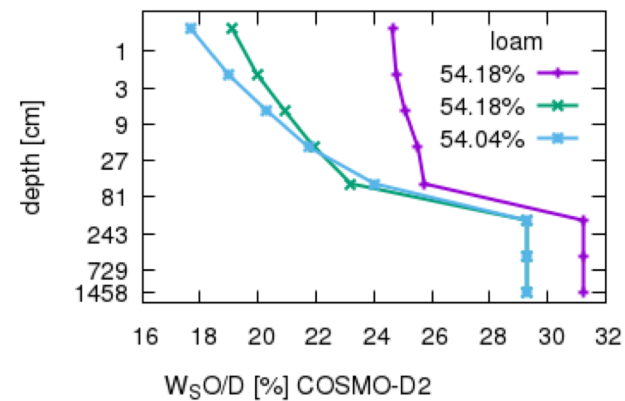
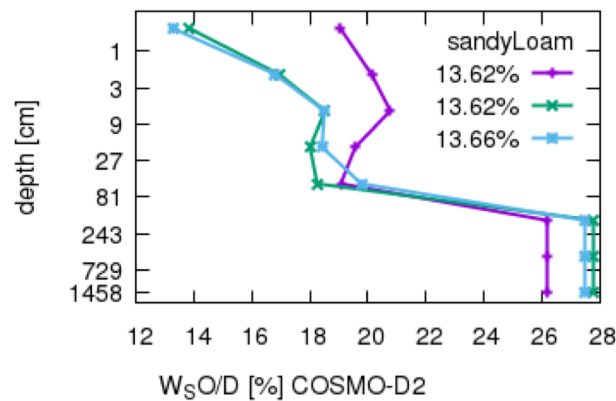
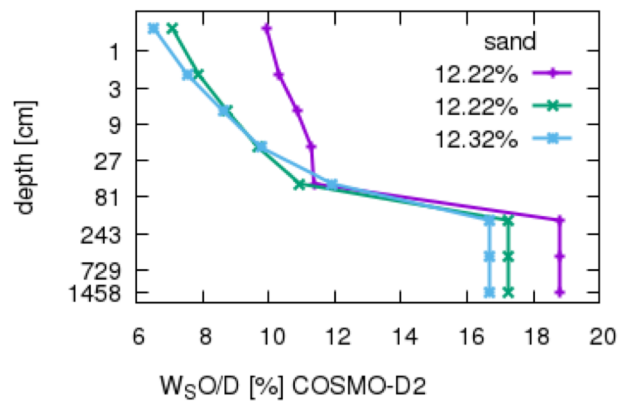
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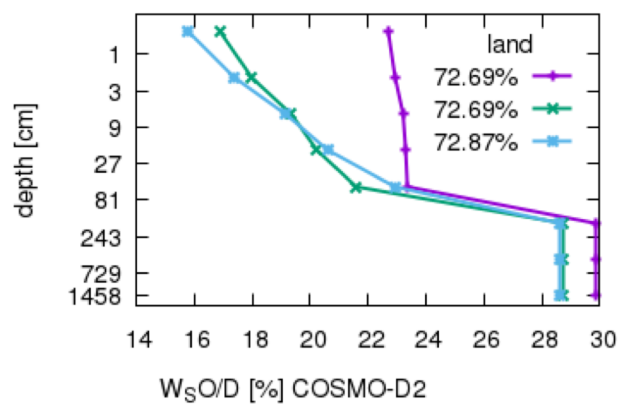
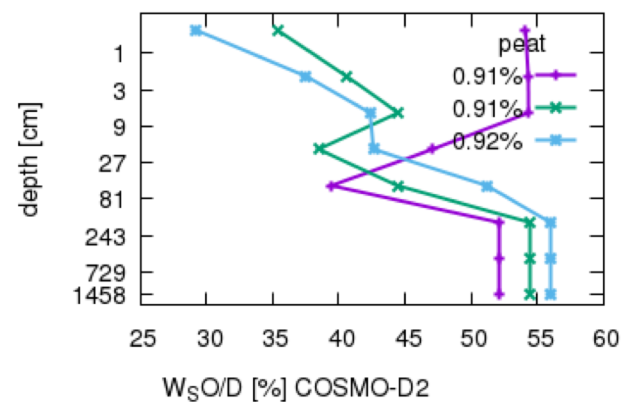
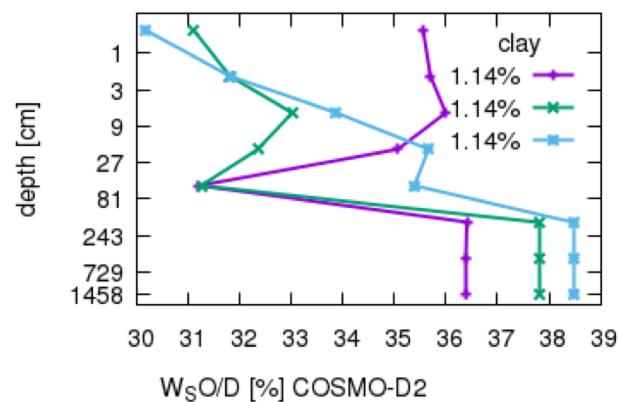
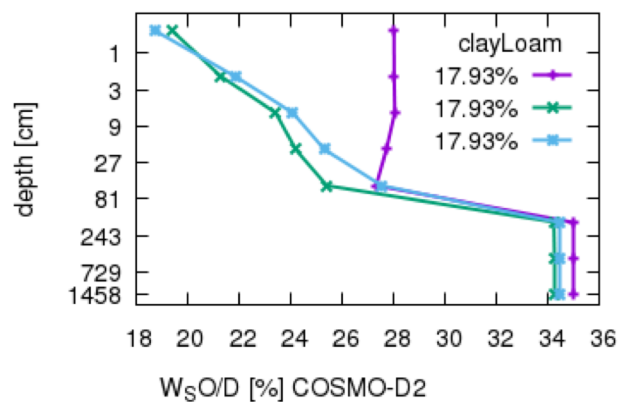
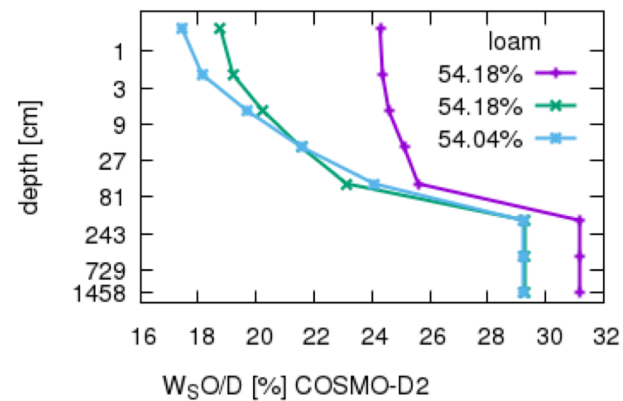
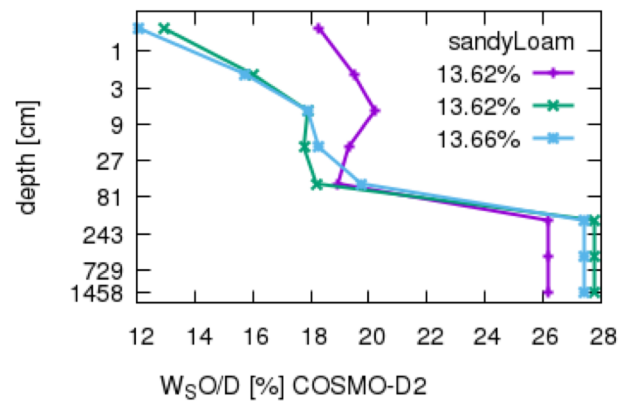
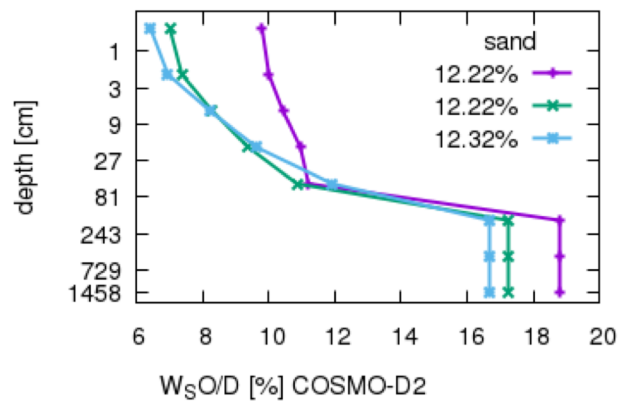
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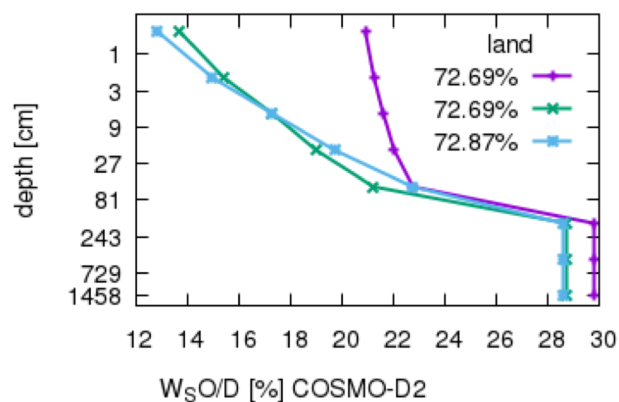
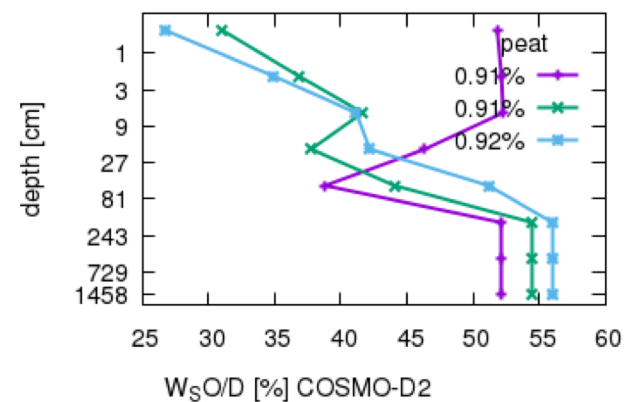
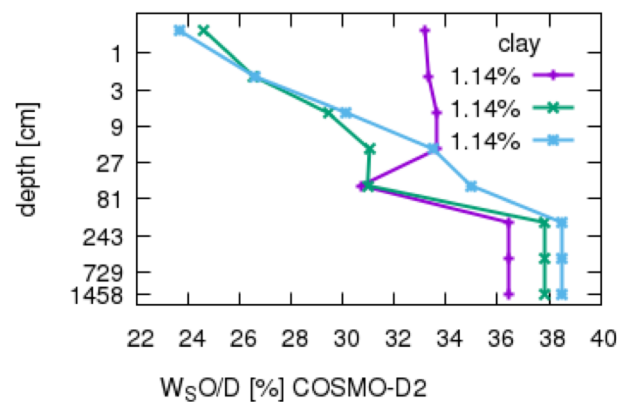
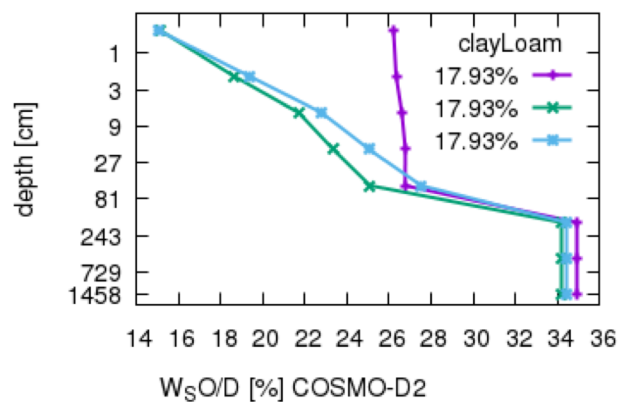
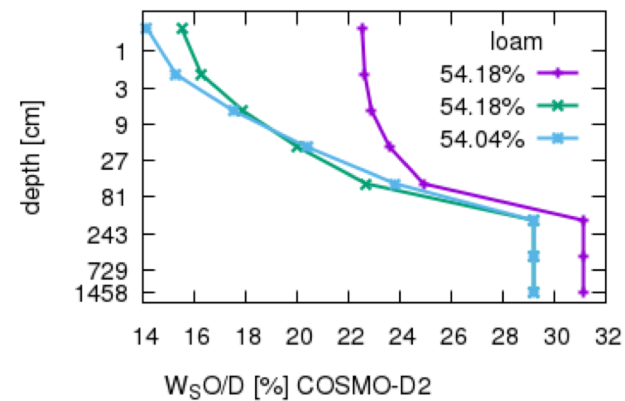
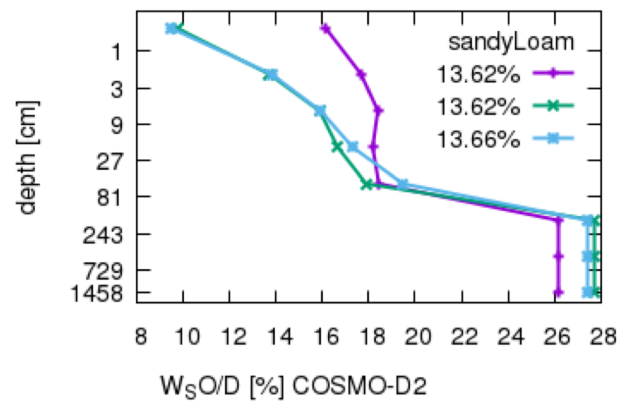
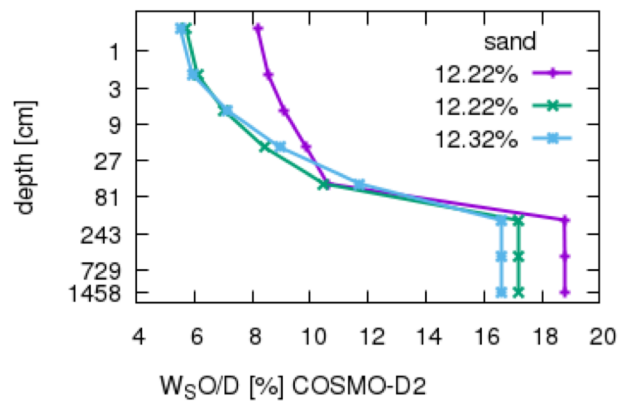


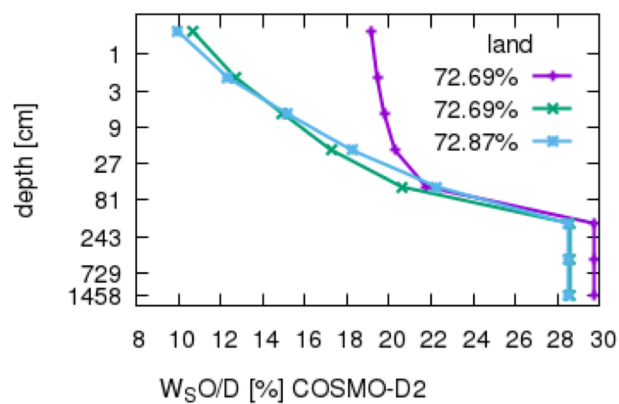
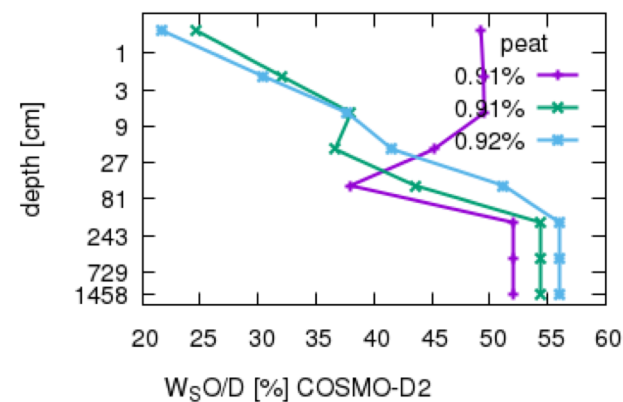
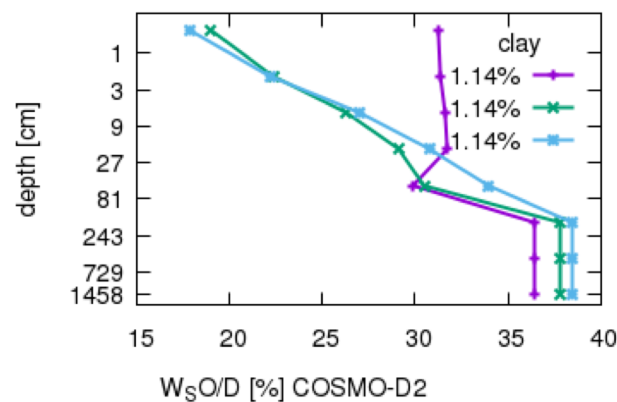
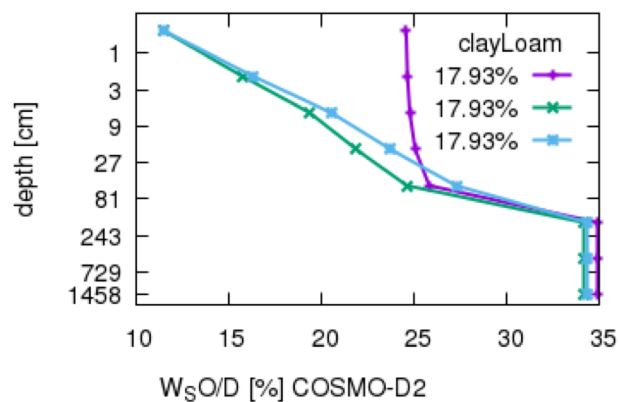
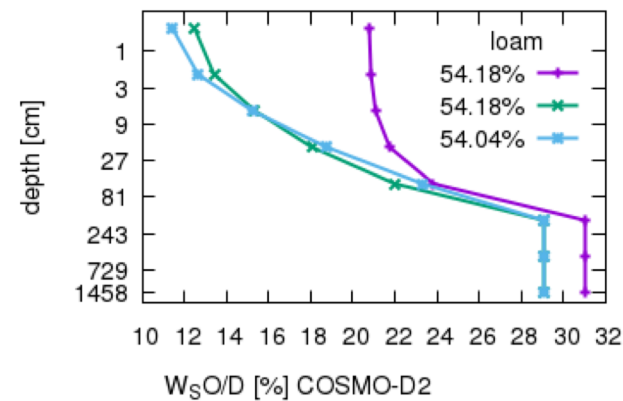
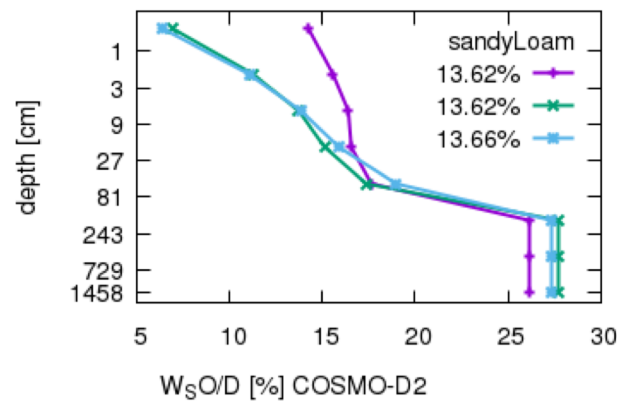
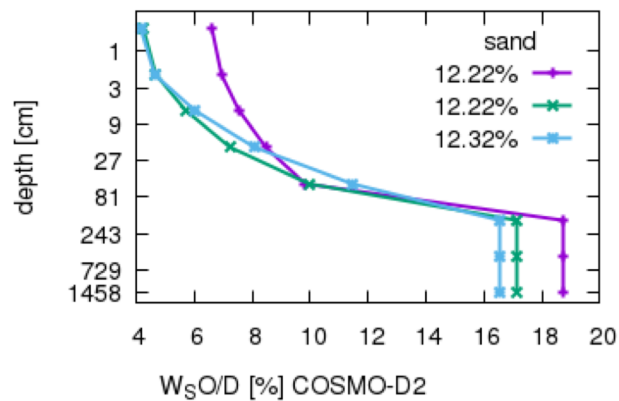


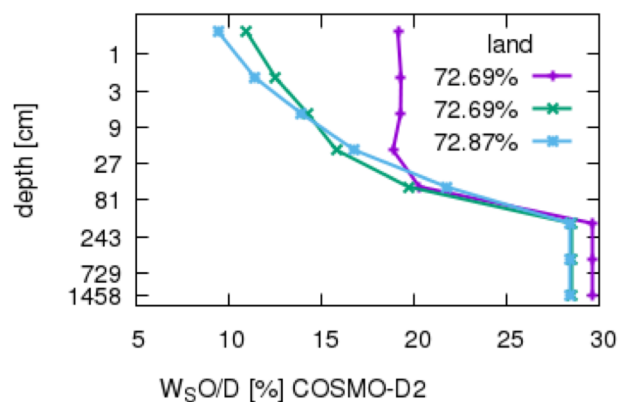
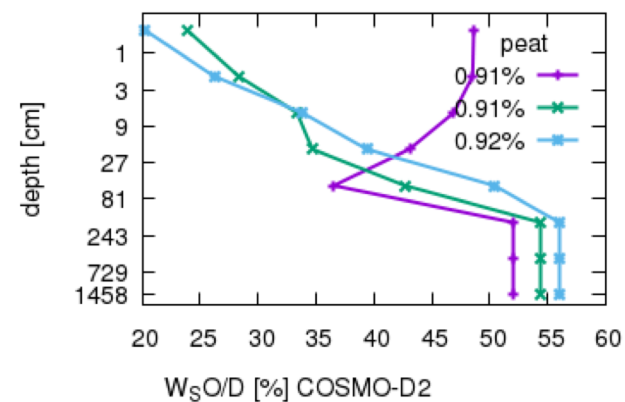
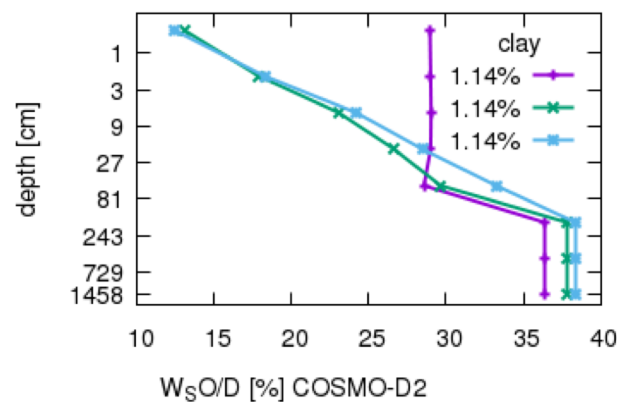
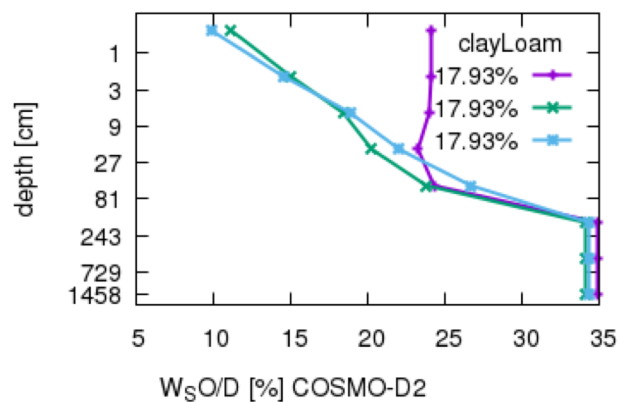
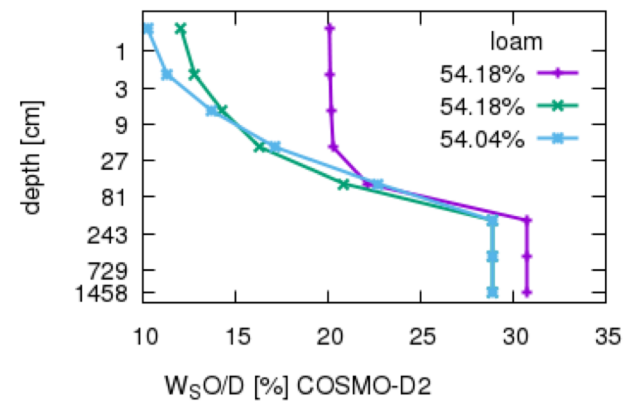
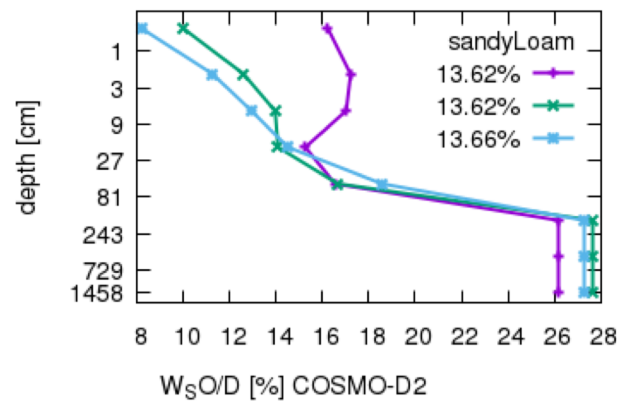
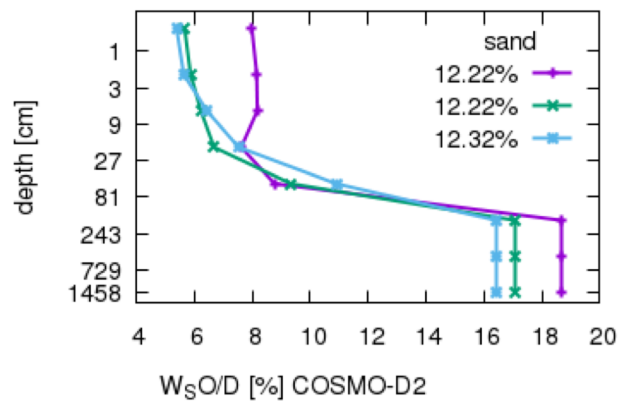


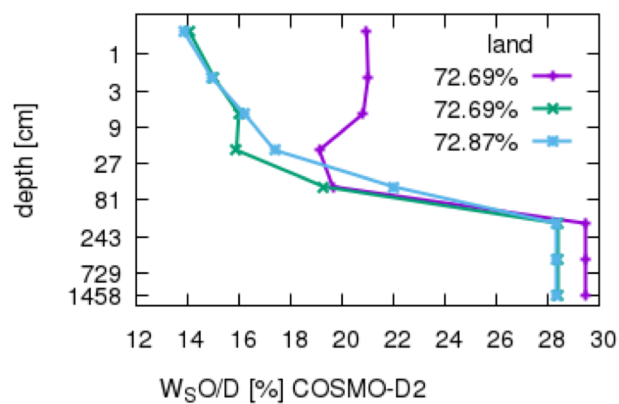
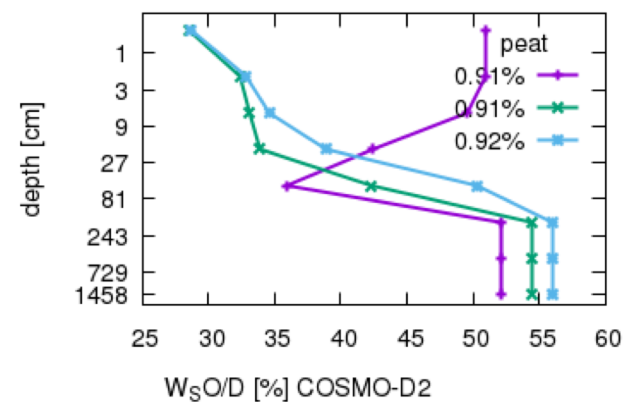
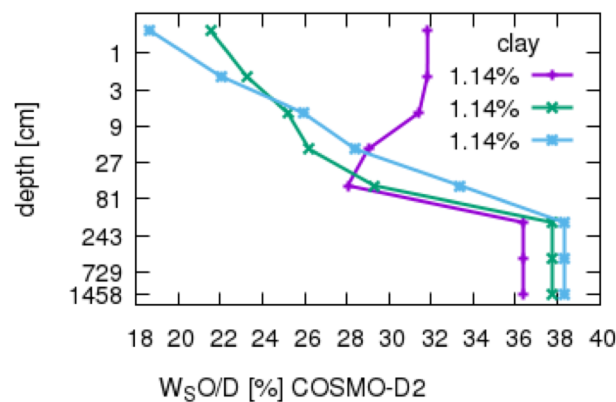
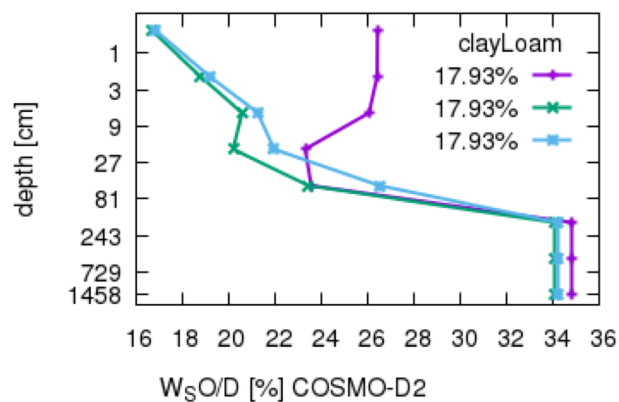
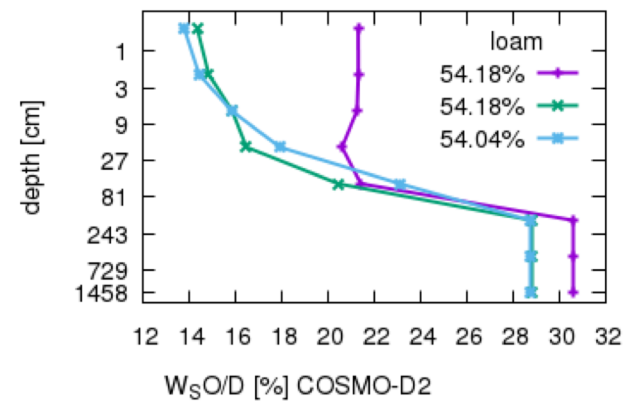
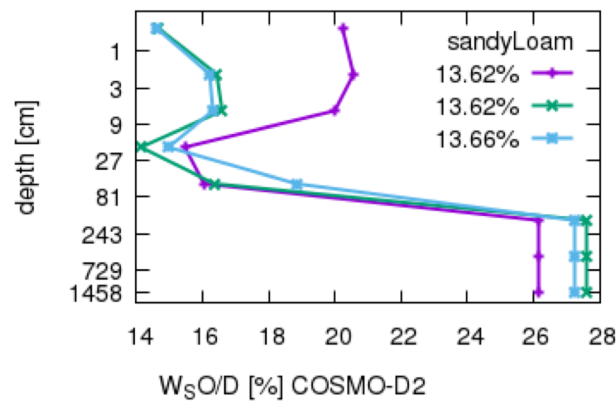
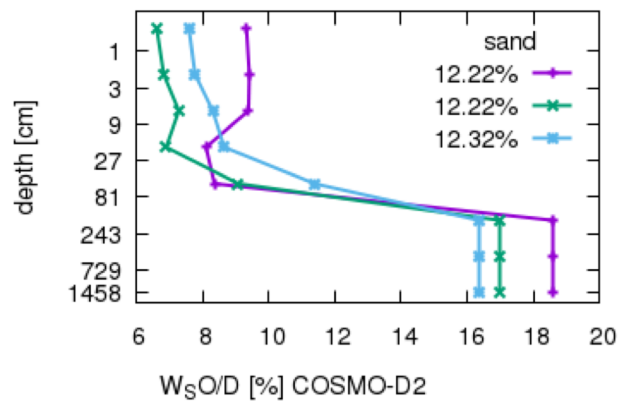


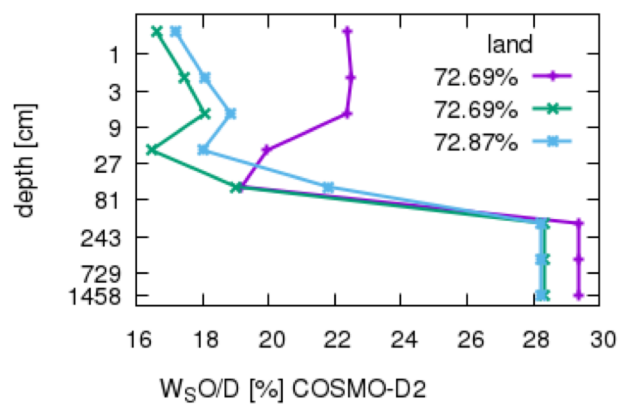
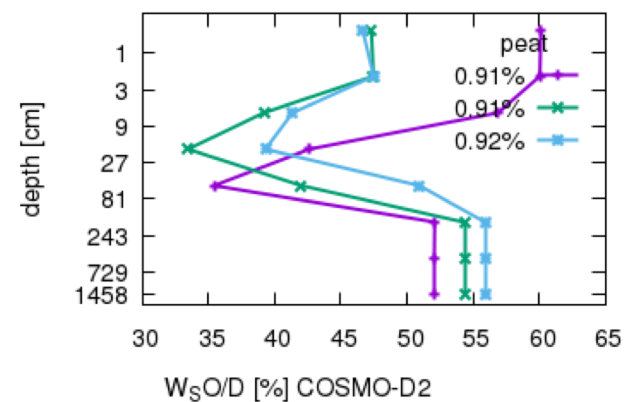
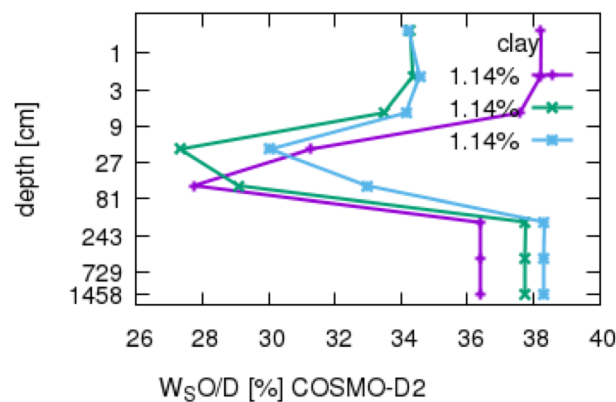
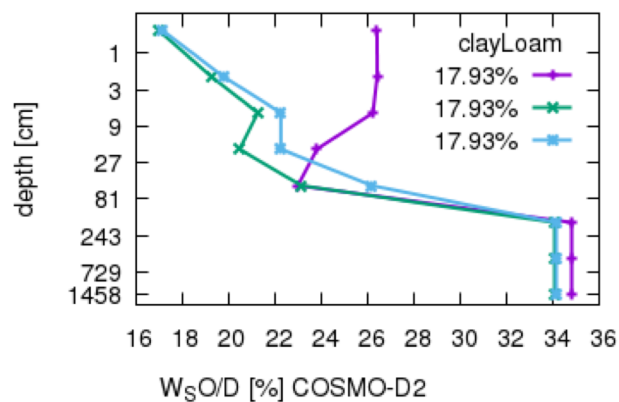
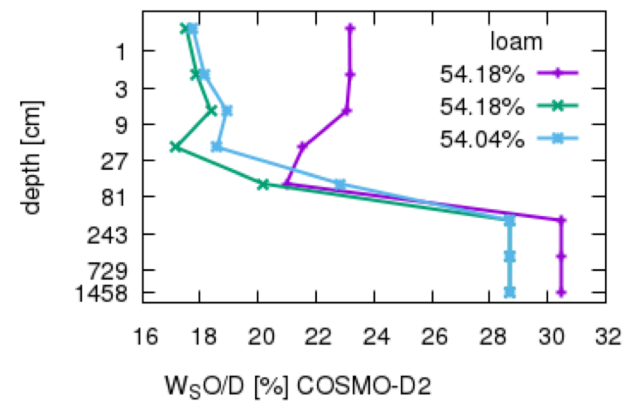
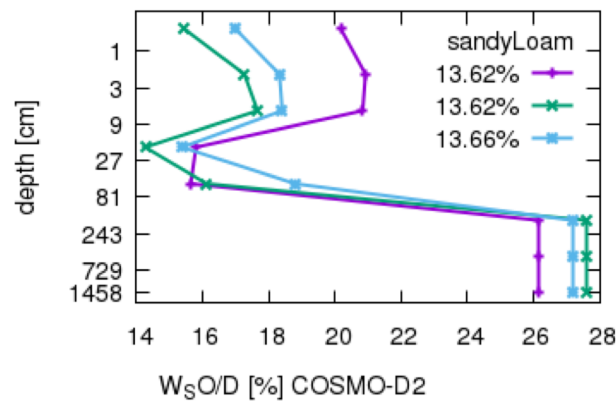
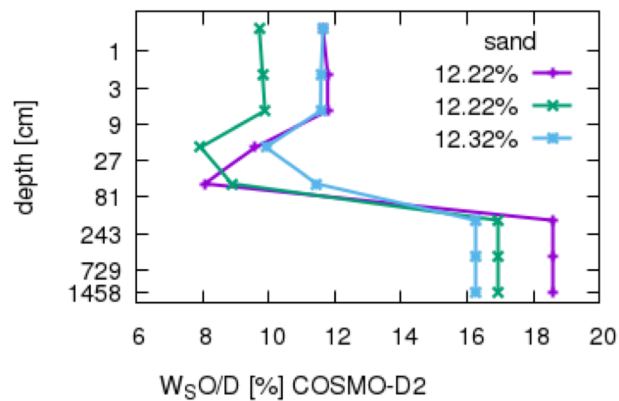


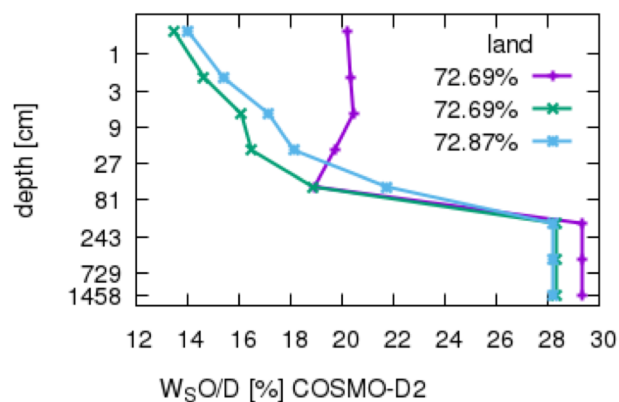
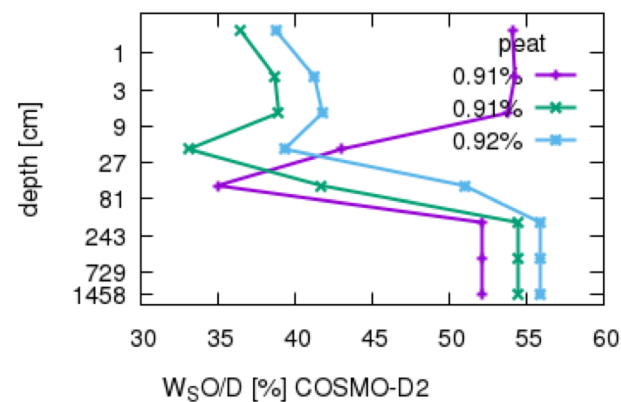
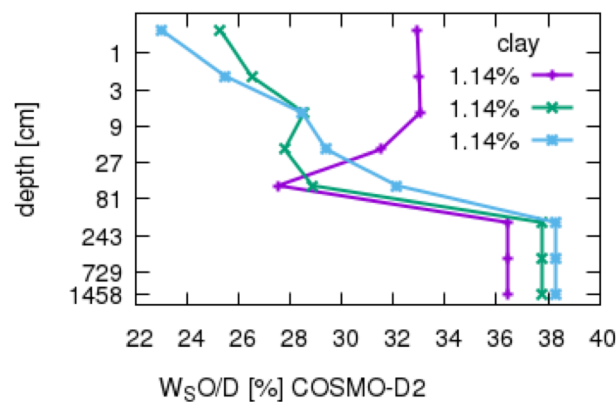
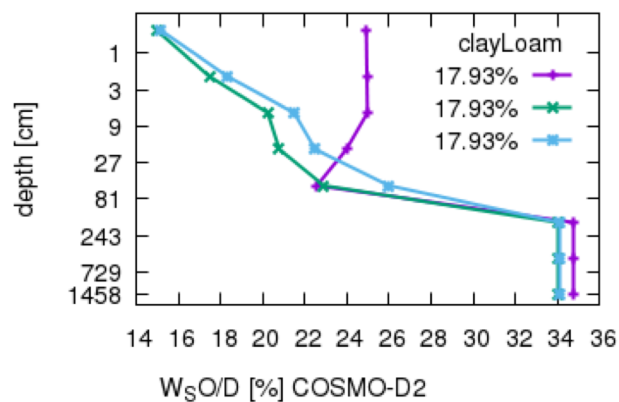
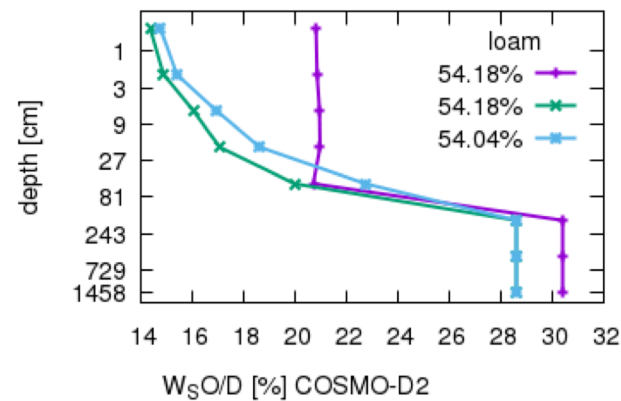
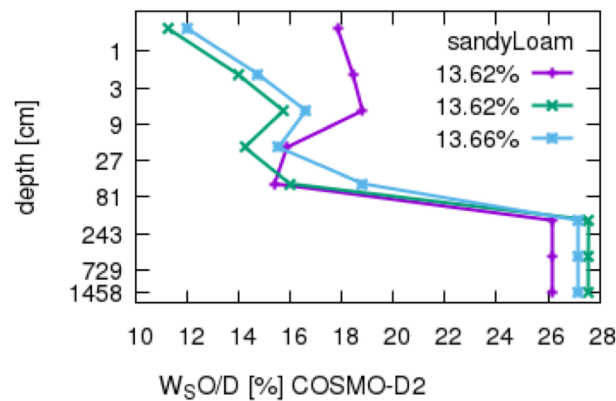
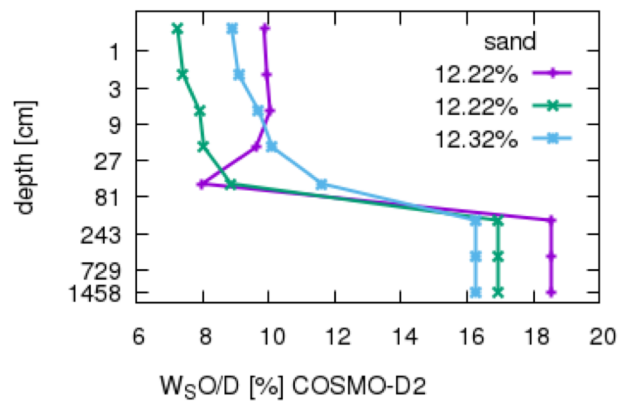


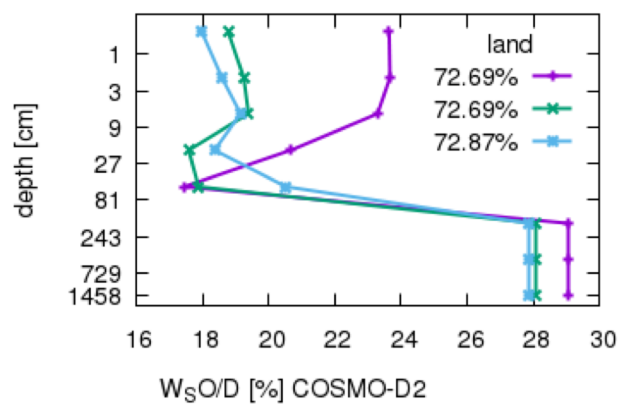
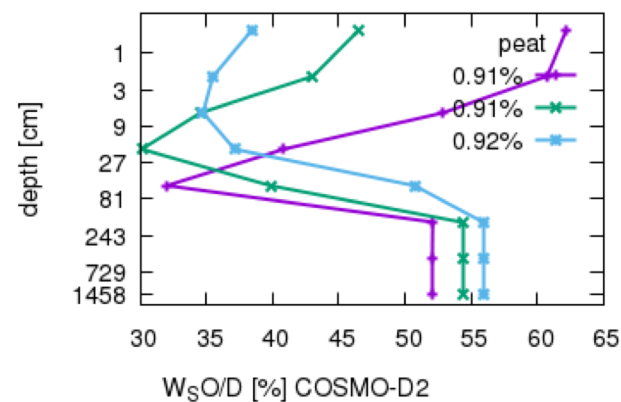
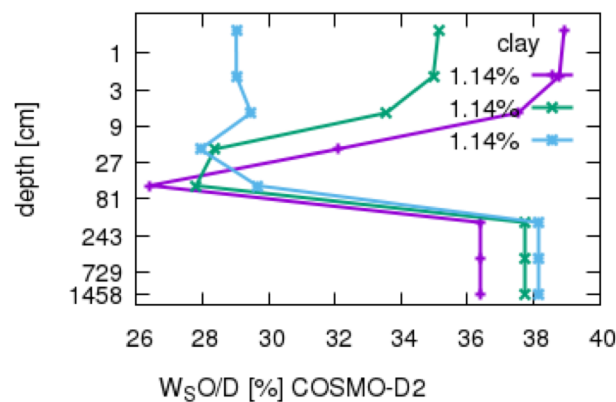
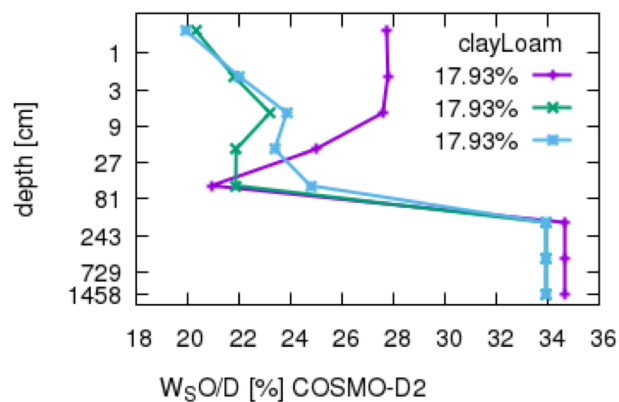
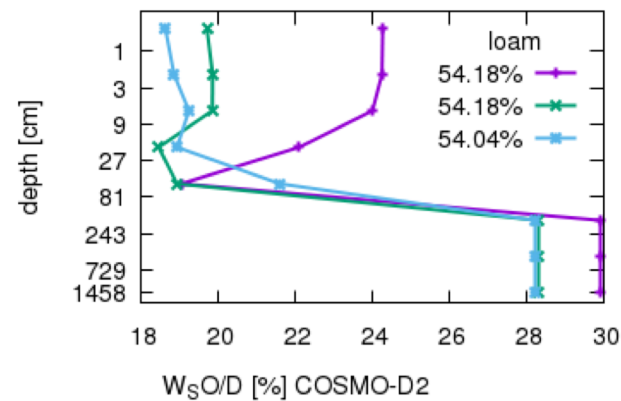
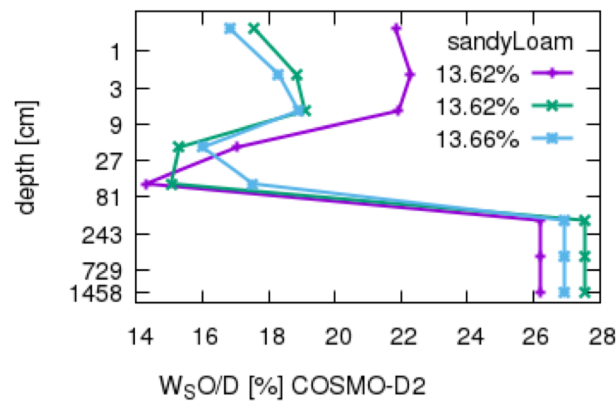
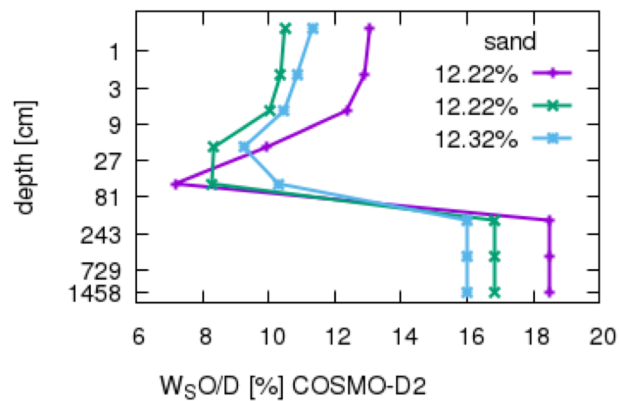


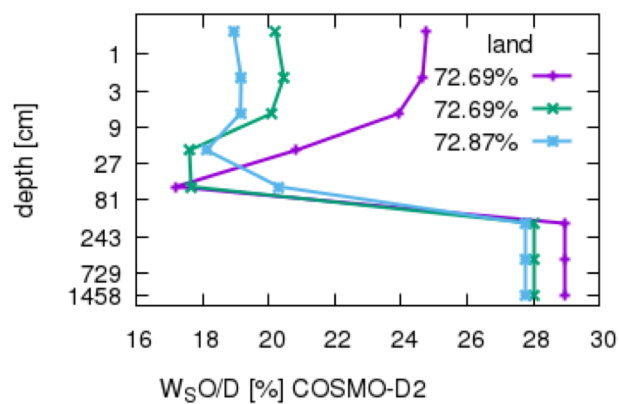
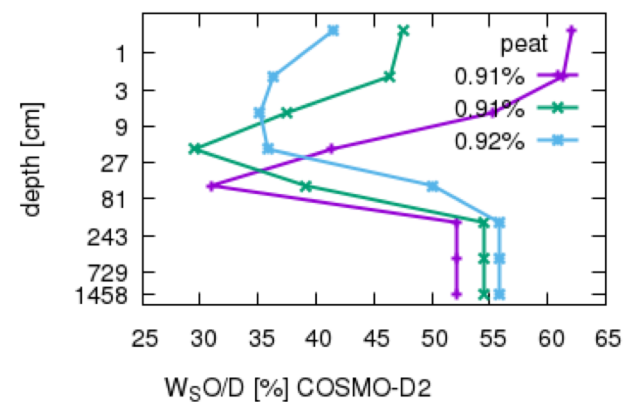
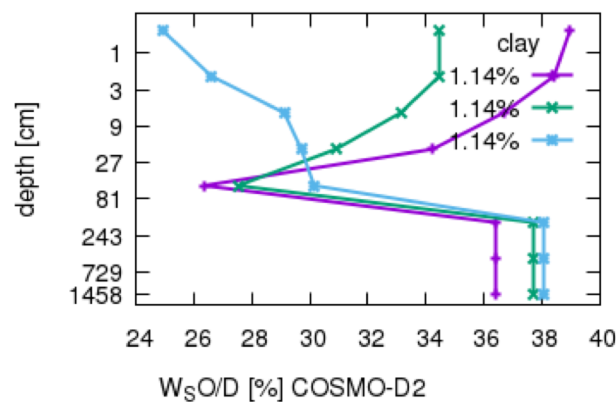
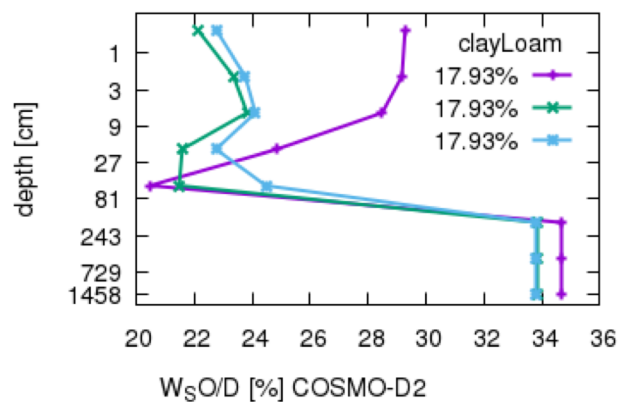
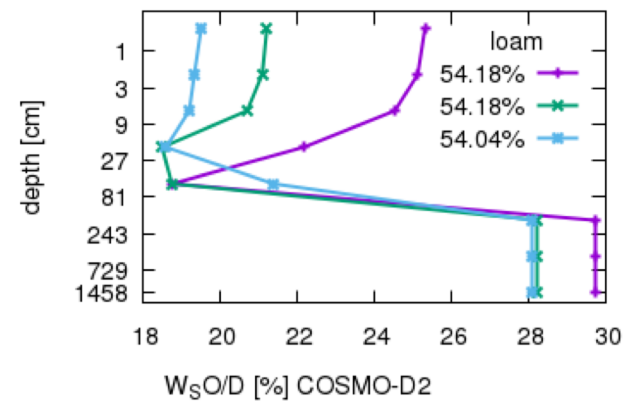
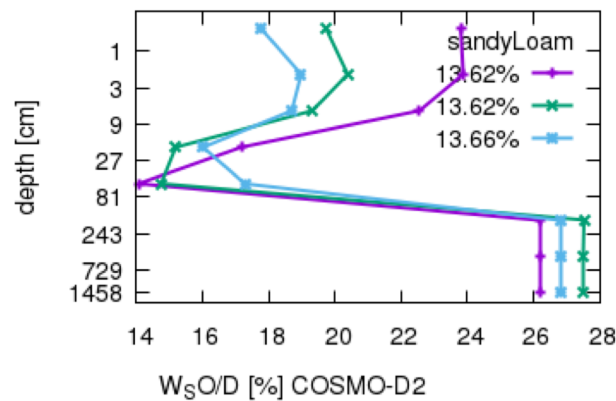
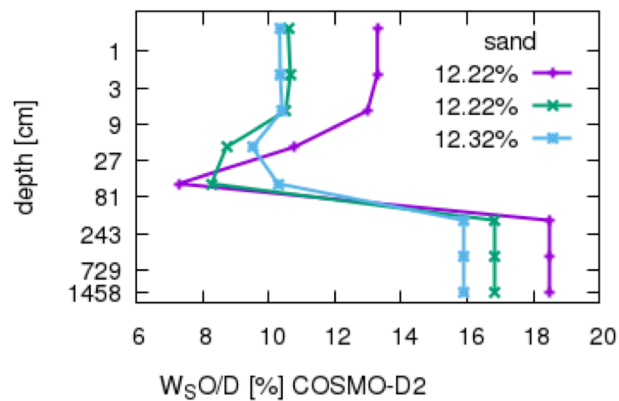


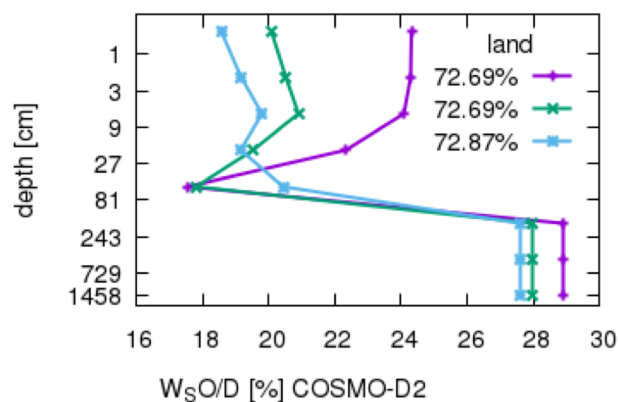
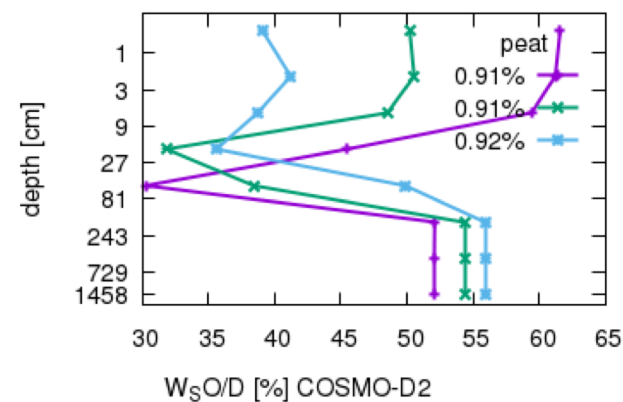
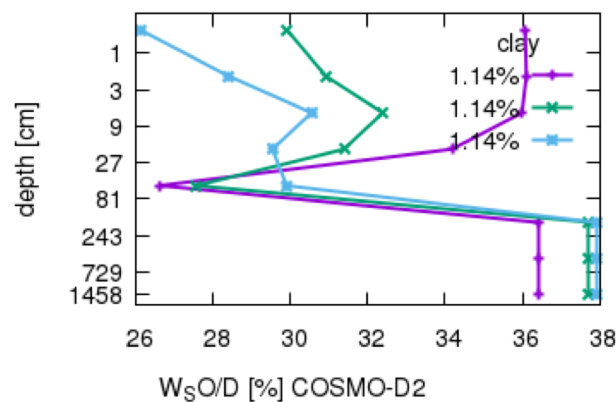
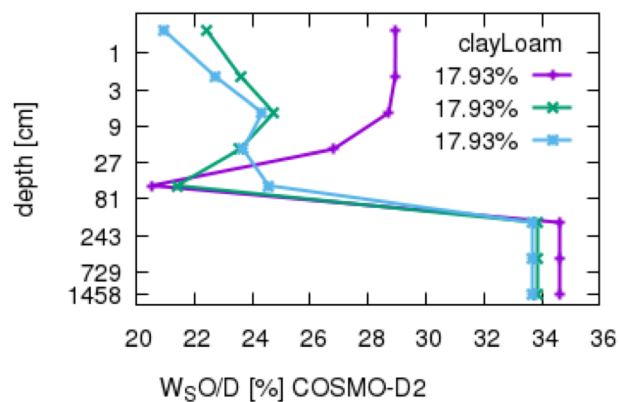
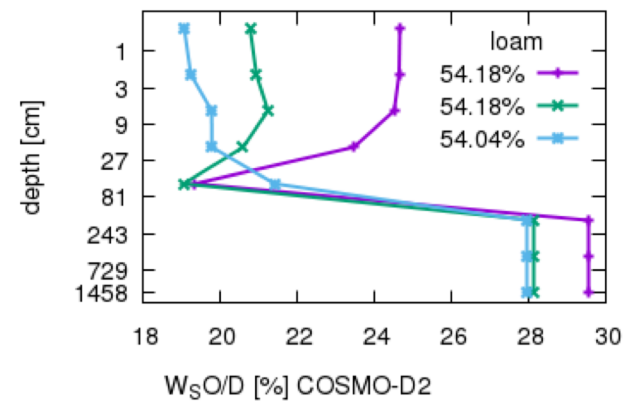
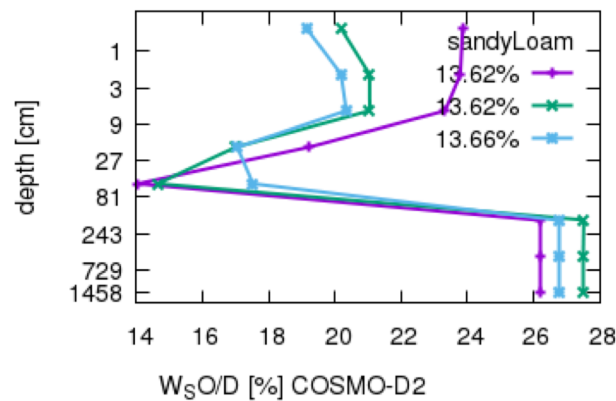
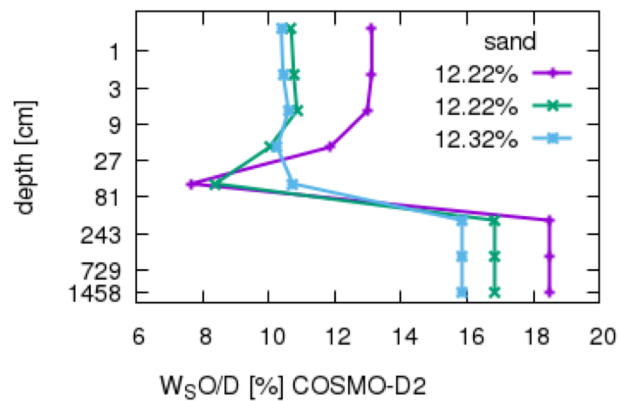


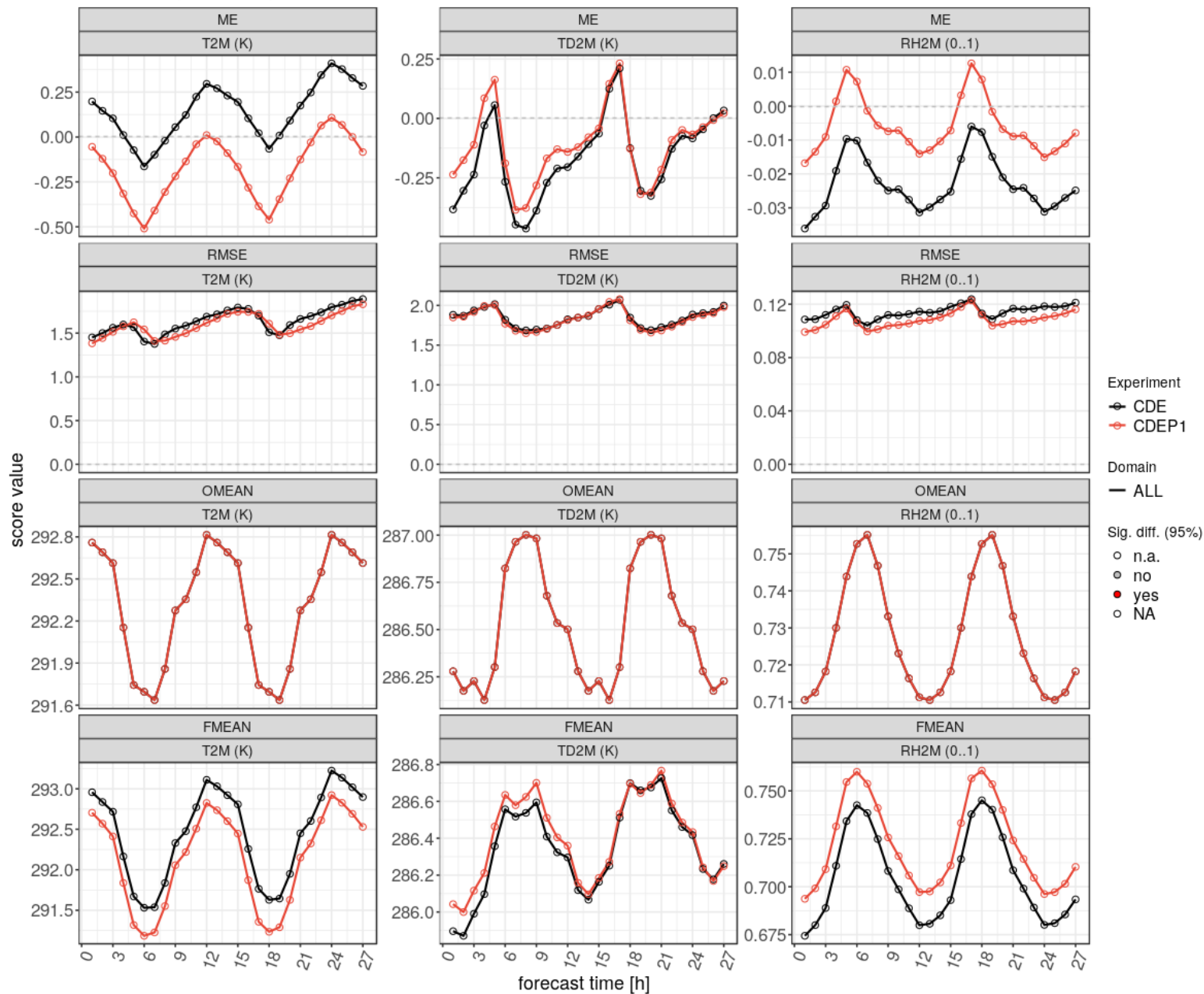












Conclusions

- The new formulations of **bare soil evaporation** and **skin temperature** were tested in COSMO-D2.
- On average, the biases and RMSE's of near-surface humidity and temperature are (substantially) reduced.
- But, the spin-up of the soil water content needs to be carried out correctly.
- It is proposed to test and eventually introduce these improvements in the different domains of the PT AEVUS partners.