



Escola de Camins
Escola Tècnica Superior d'Enginyeria de Camins, Canals i Ports
UPC BARCELONATECH

Hydraulic tomography coupled to dissolved oxygen measurements of a managed aquifer recharge system

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Sònia Jou i Claus

Màster en:

Enginyeria ambiental

Barcelona, 28 de setembre de 2022

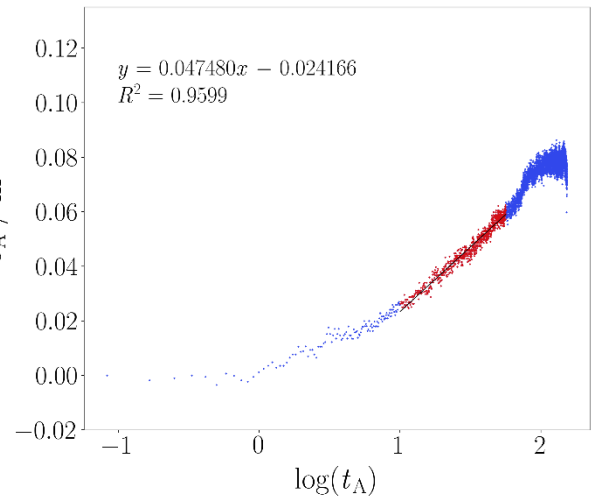
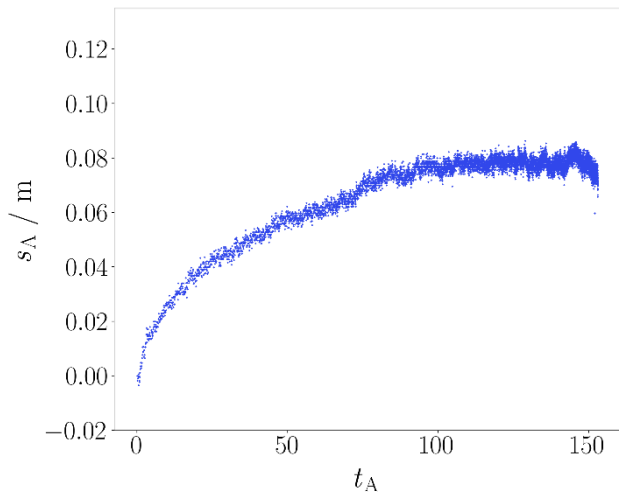
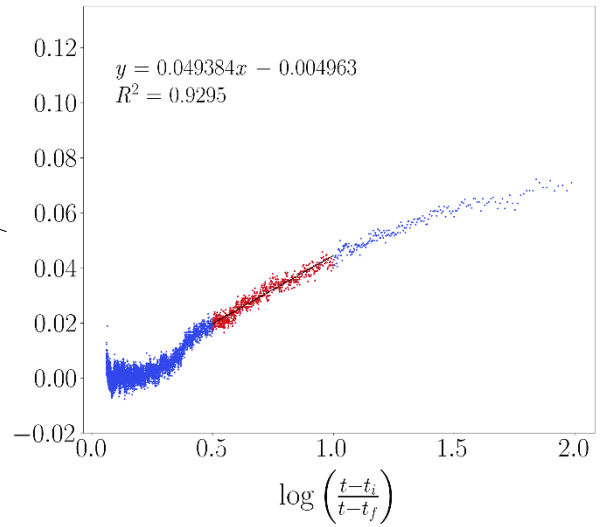
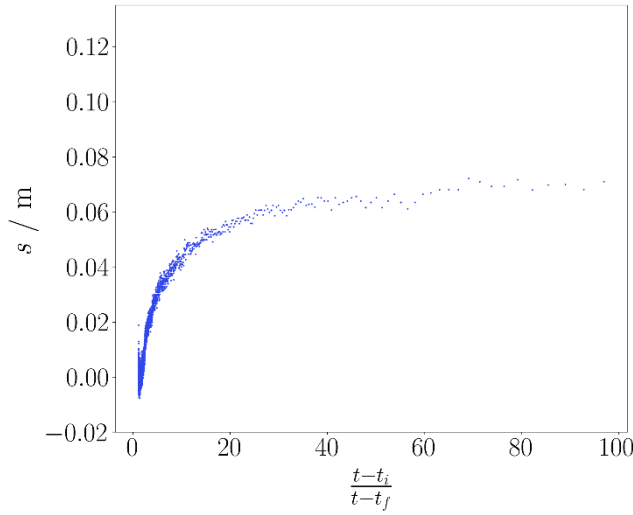
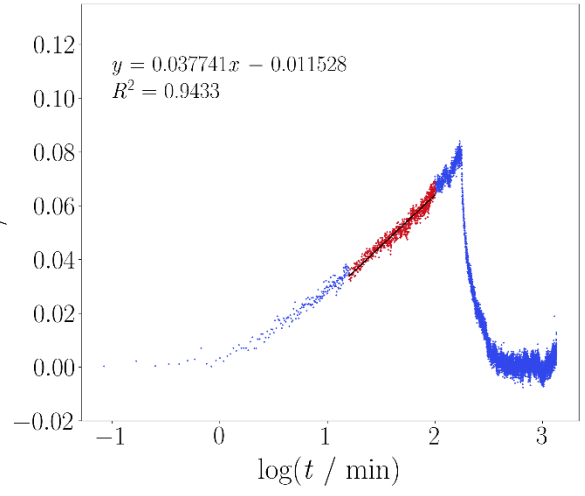
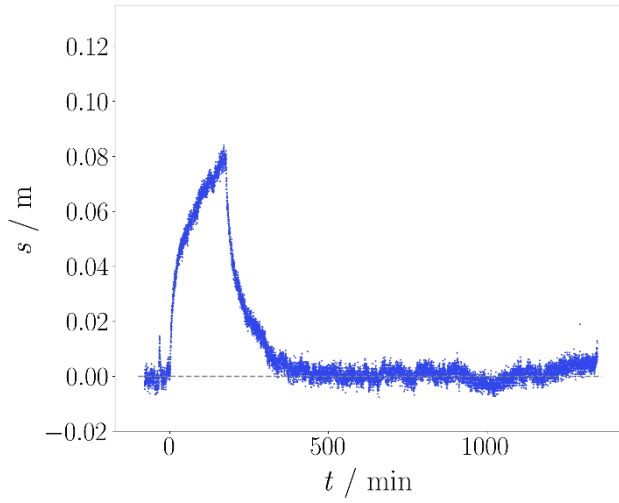
Departament d'Enginyeria Civil i Ambiental

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Appendix

Linear regression analyses

The figures presented here are the results of the four pumping test analyses performed in the pilot-scale artificial aquifer in the WWTP of Palamós. Each figure represents the results for a given piezometre and a given pumping test, and the plots are organised in rows according to the method of analysis, which are the following (from top to bottom): Theis drawdown, Theis recovery, Agarwal recovery, and modified Agarwal recovery. The plots in the left column are presented with time on a linear scale, and those on the right are presented with time on a \log_{10} scale. It is the latter which are used to perform the linear regression analyses from which the relevant hydraulic parameters are determined.



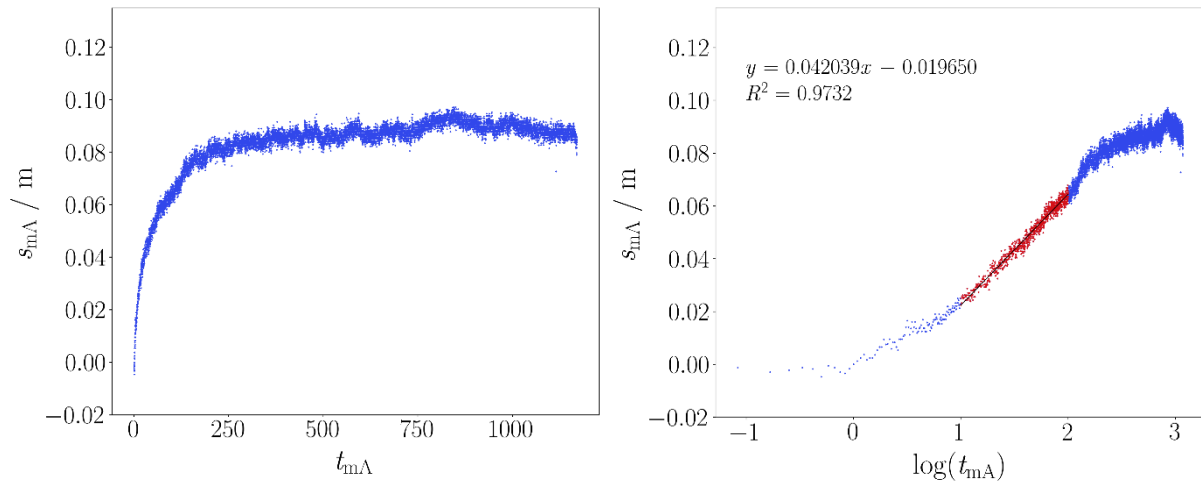
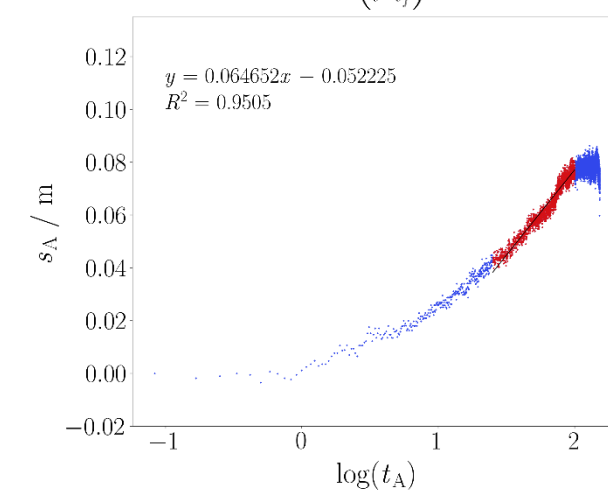
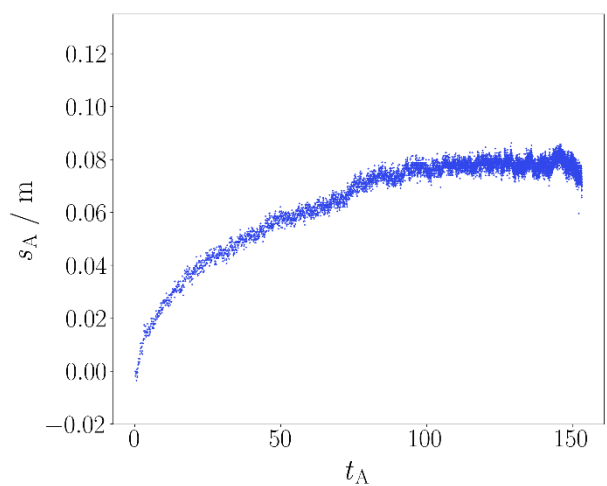
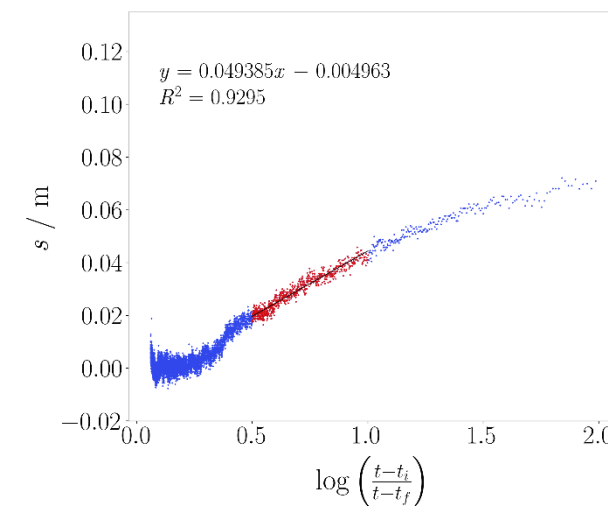
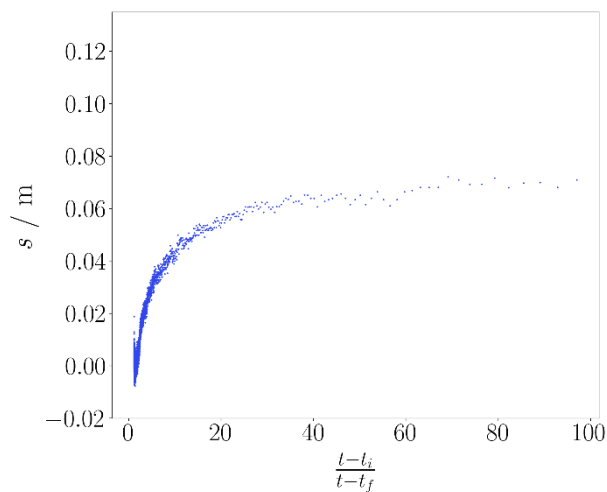
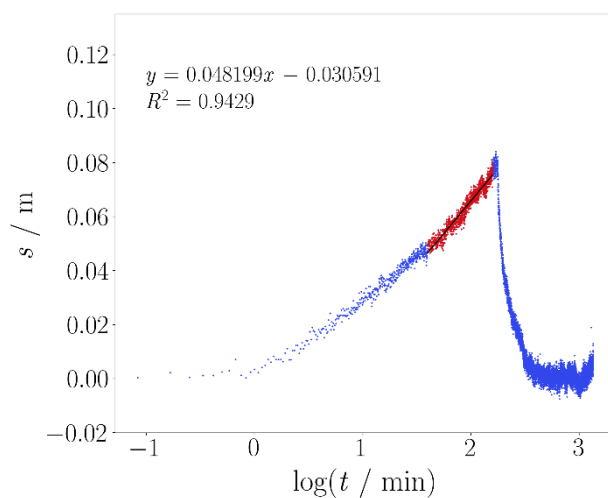
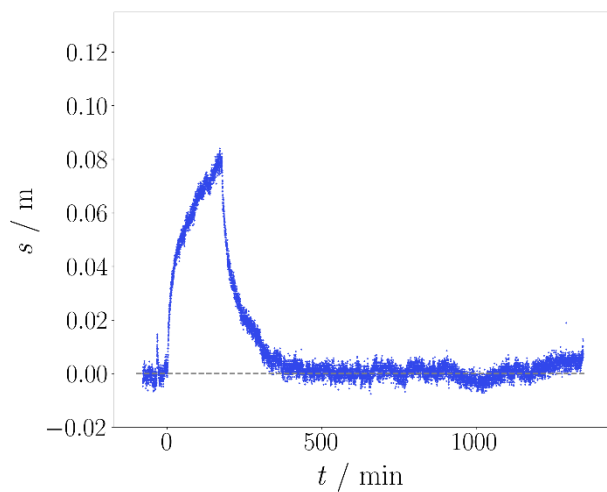


Figure A.1. Linear regression analysis of drawdown and recovery data for piezometre B1 for PT1.



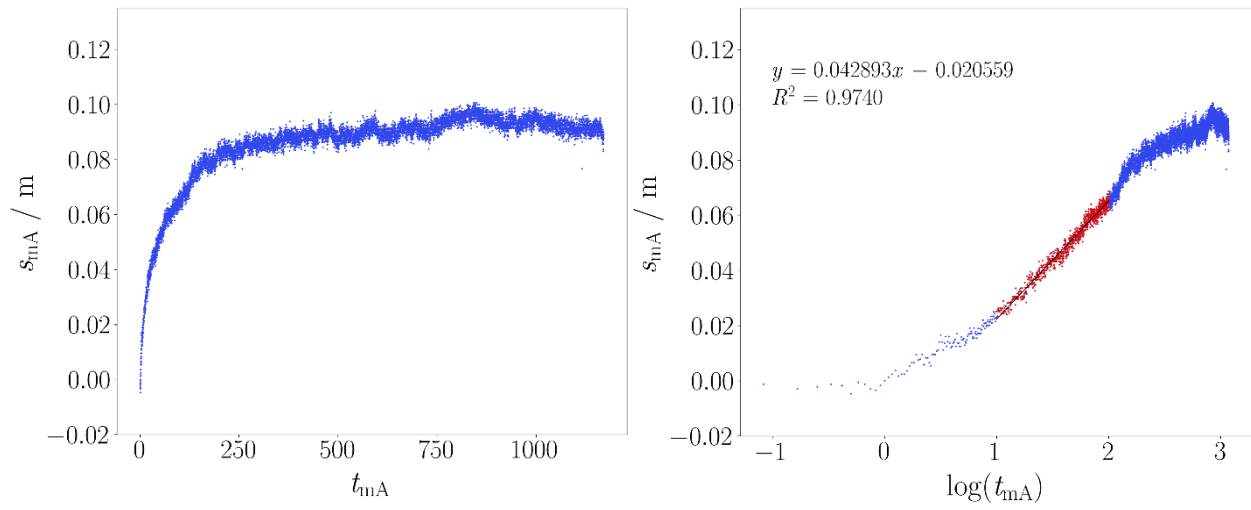
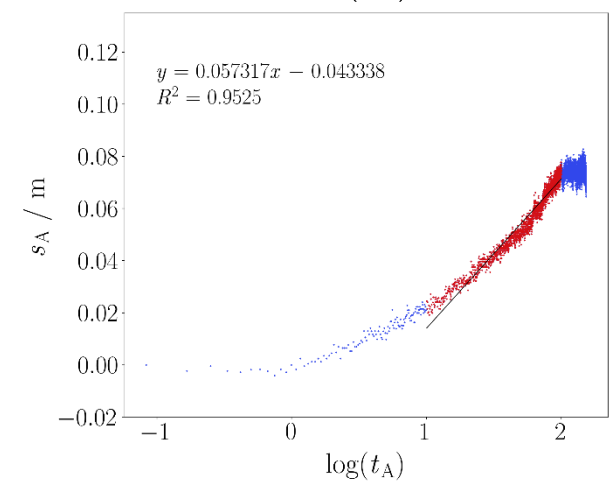
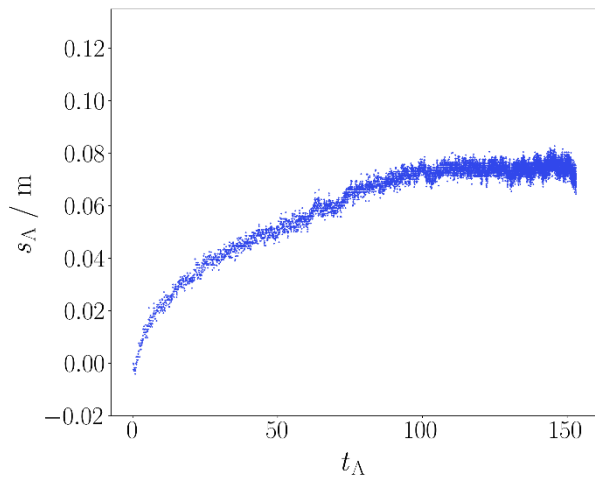
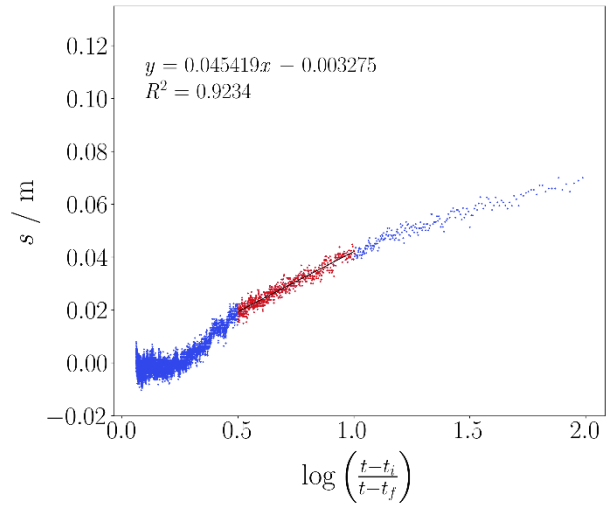
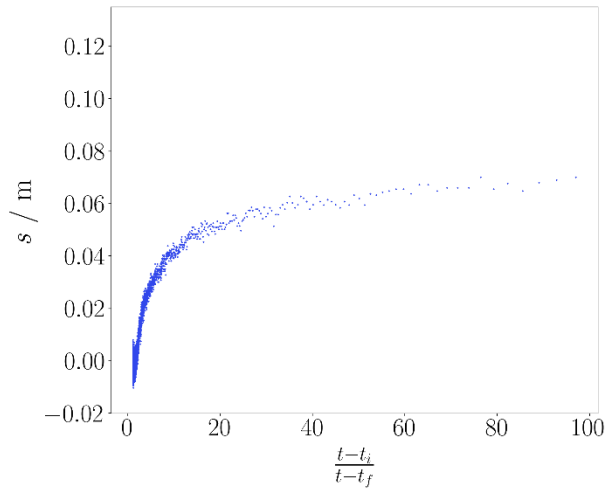
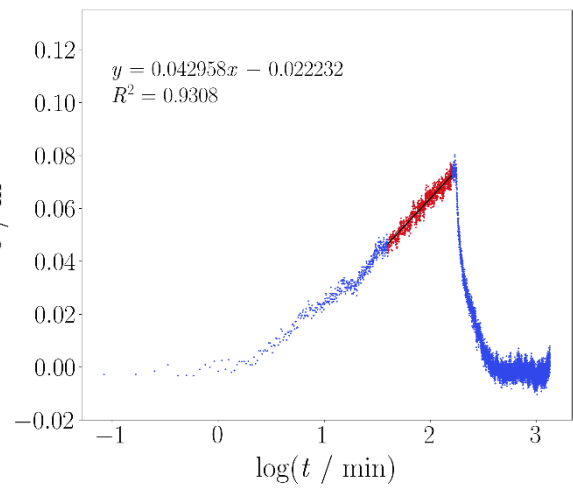
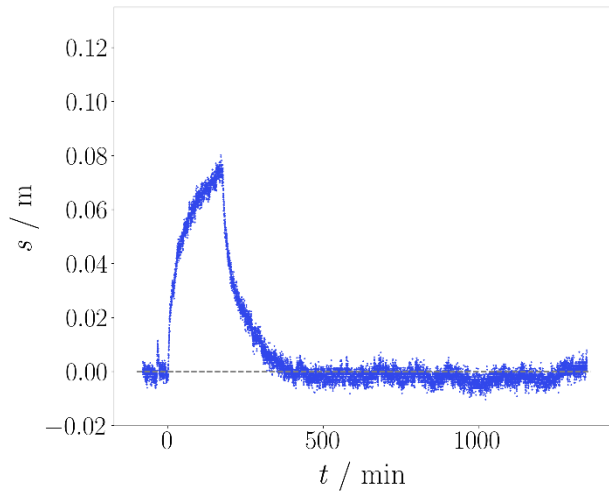


Figure A.2. Linear regression analysis of drawdown and recovery data for piezometre BCP1 for PT1.



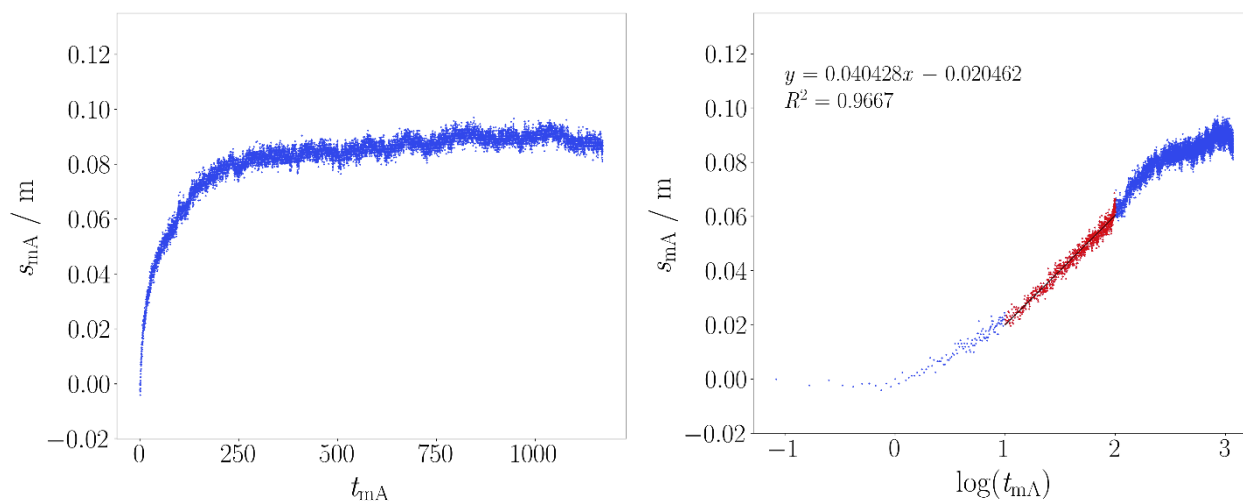
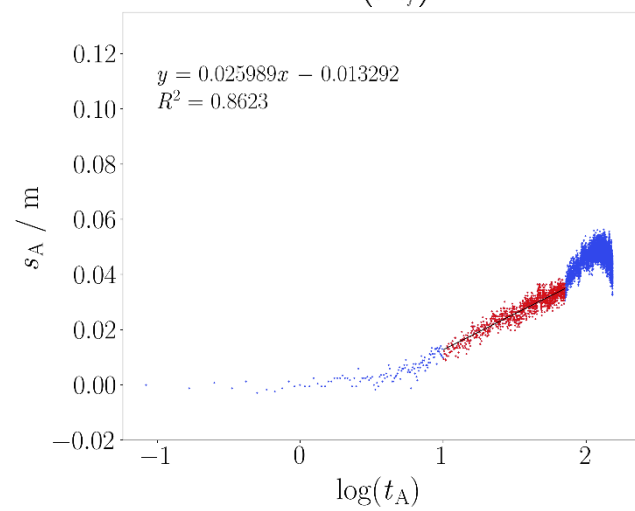
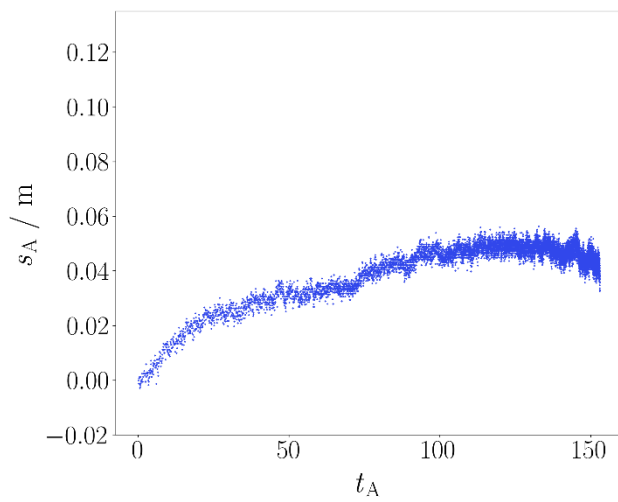
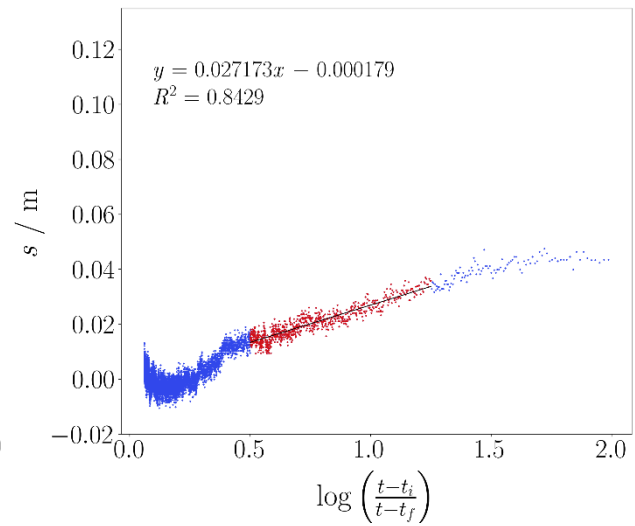
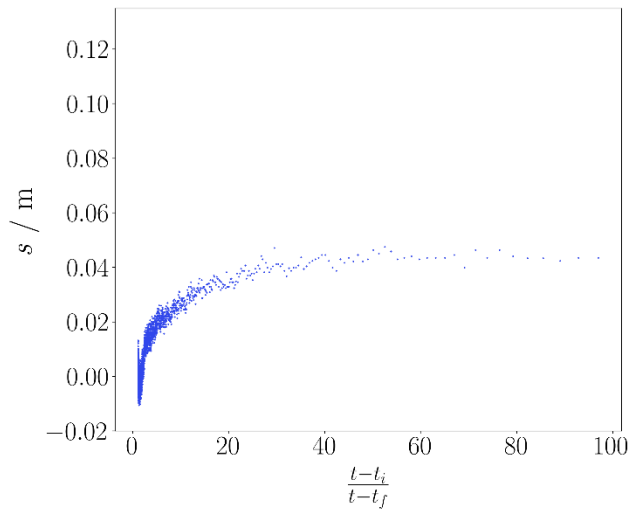
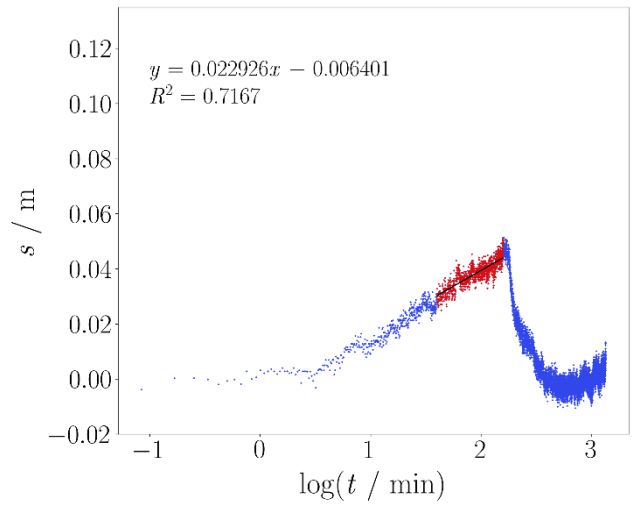
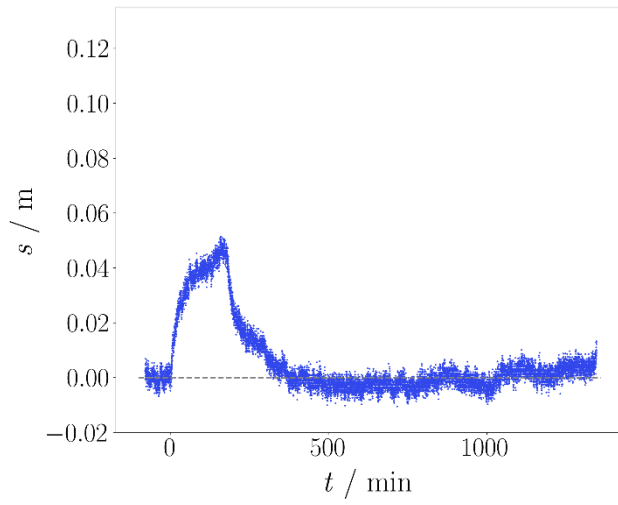


Figure A.3. Linear regression analysis of drawdown and recovery data for piezometre BCP2 for PT1.



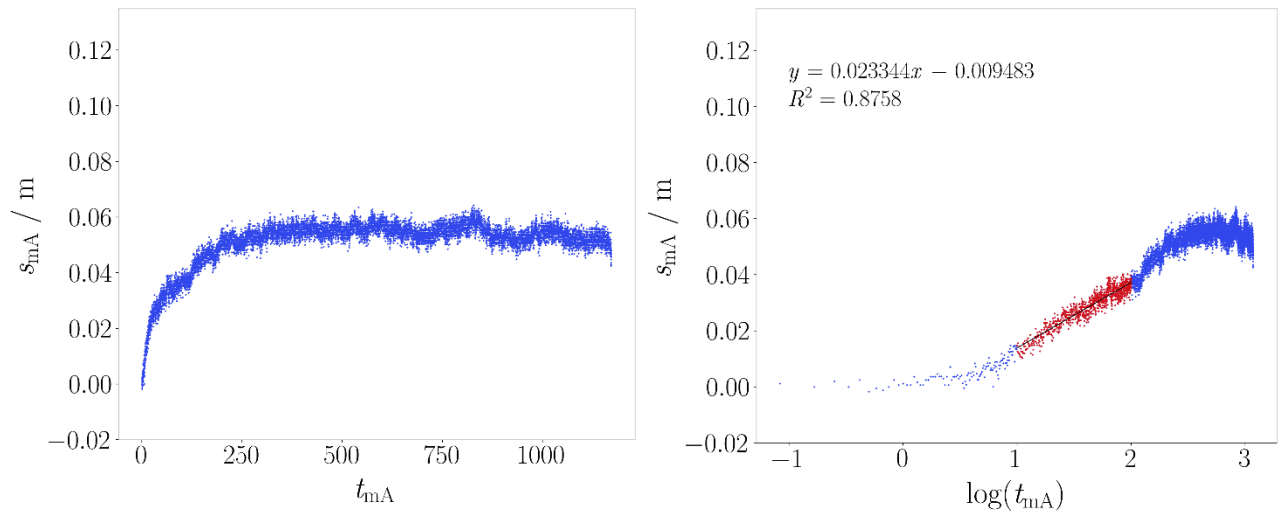
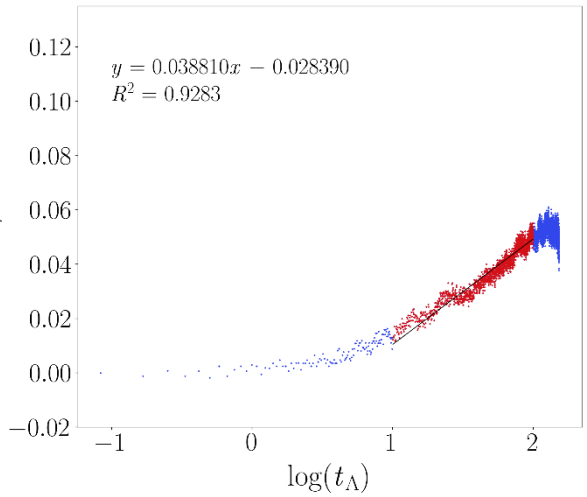
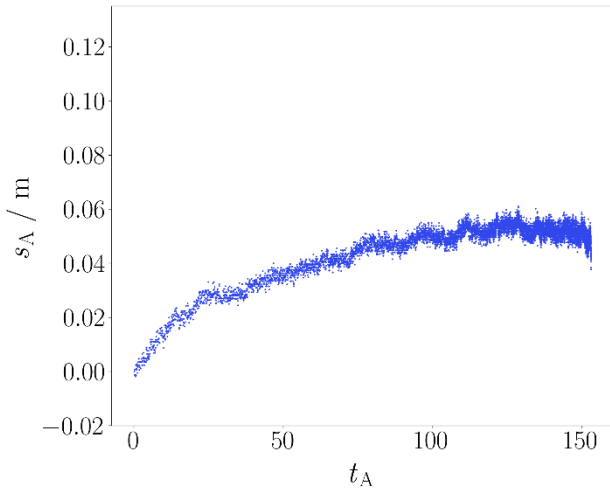
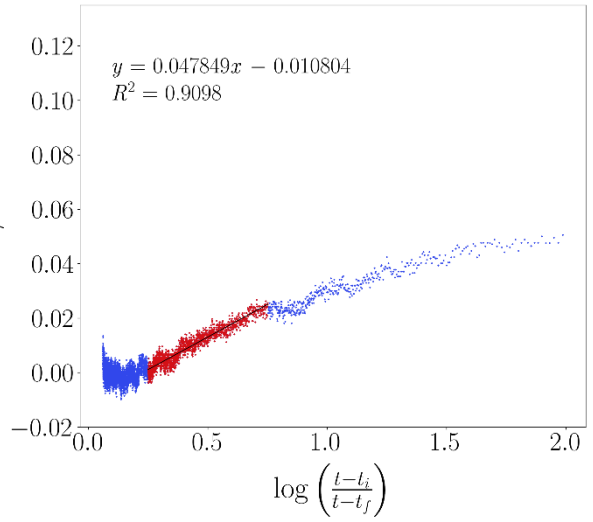
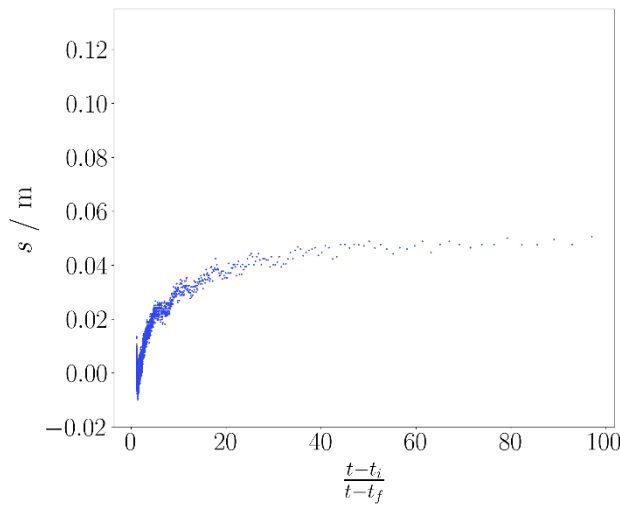
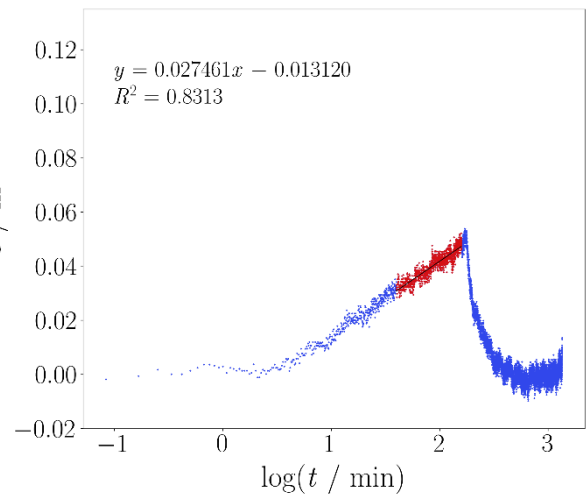
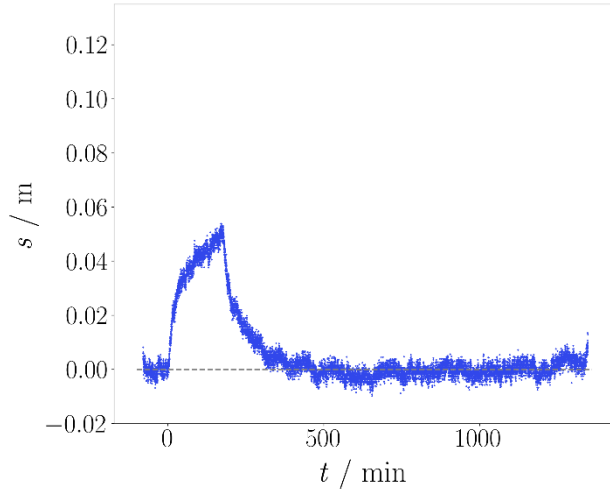


Figure A.4. Linear regression analysis of drawdown and recovery data for piezometre DCP1 for PT1.



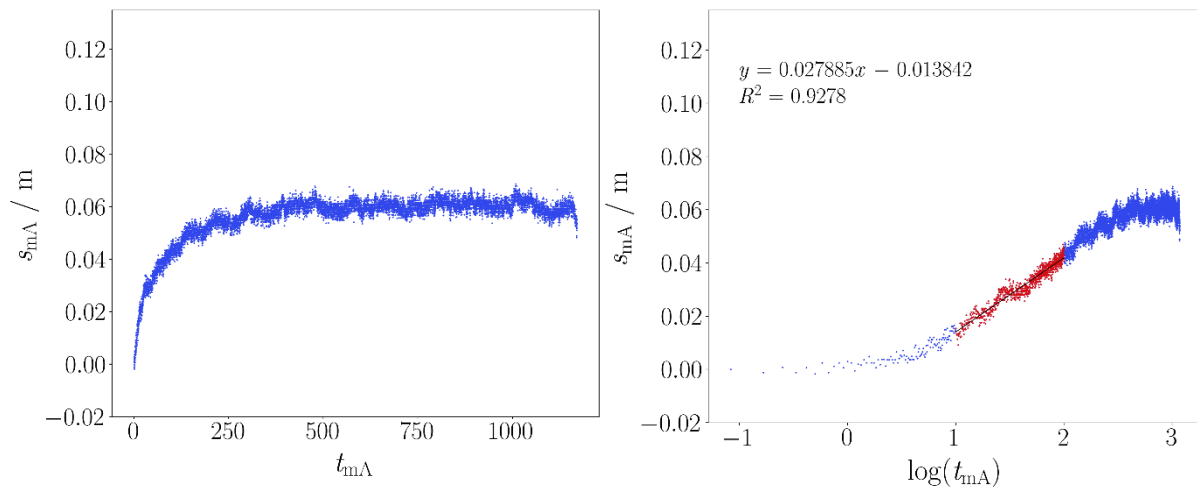
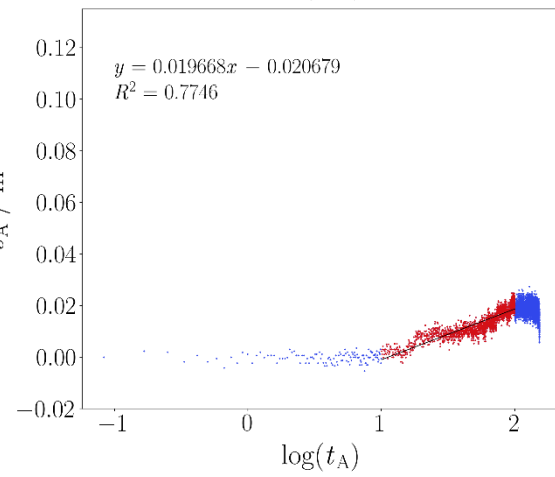
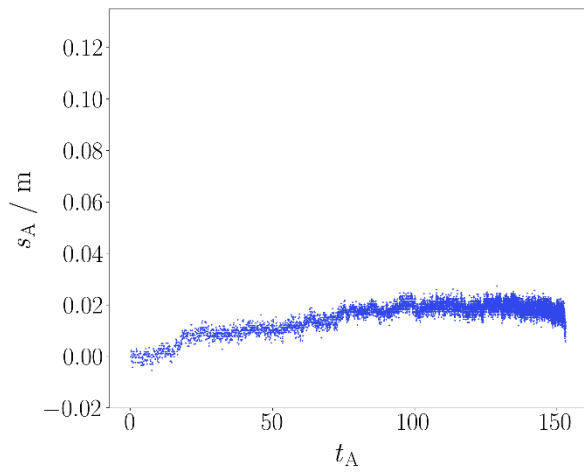
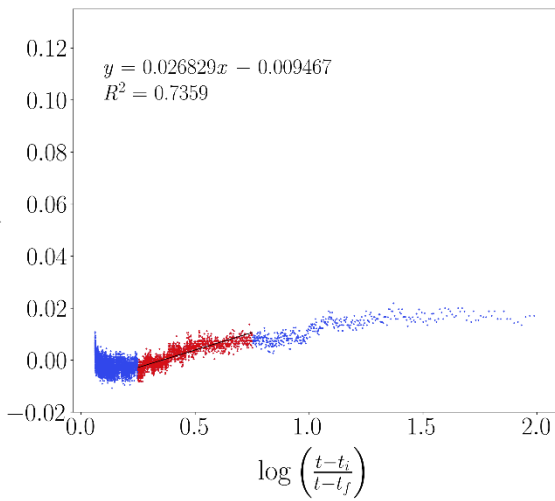
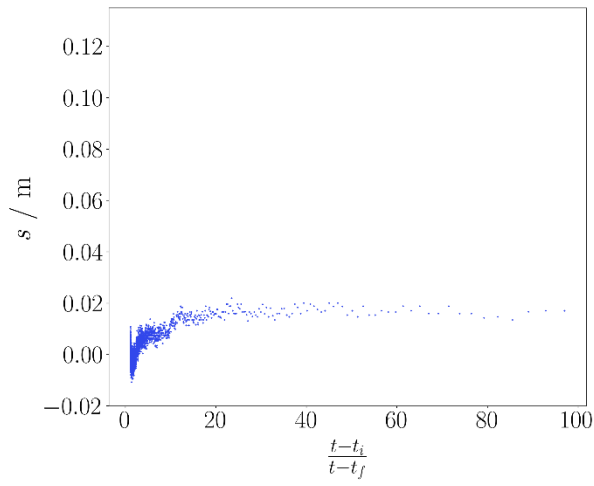
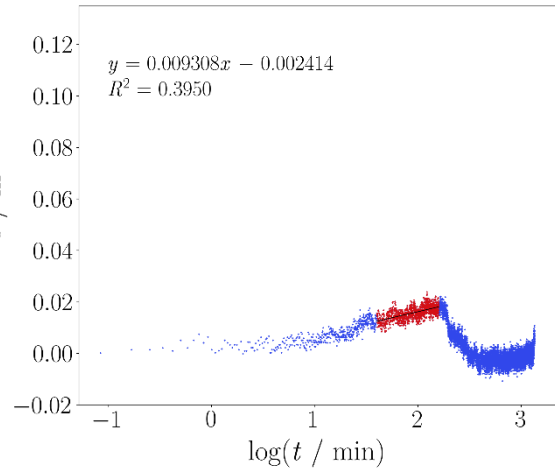
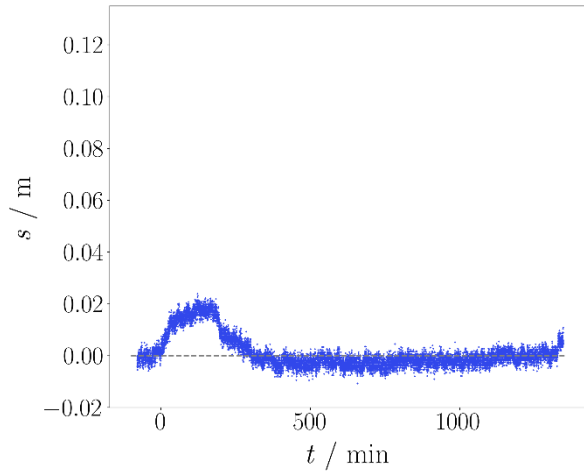


Figure A.5. Linear regression analysis of drawdown and recovery data for piezometre DCP2 for PT1.



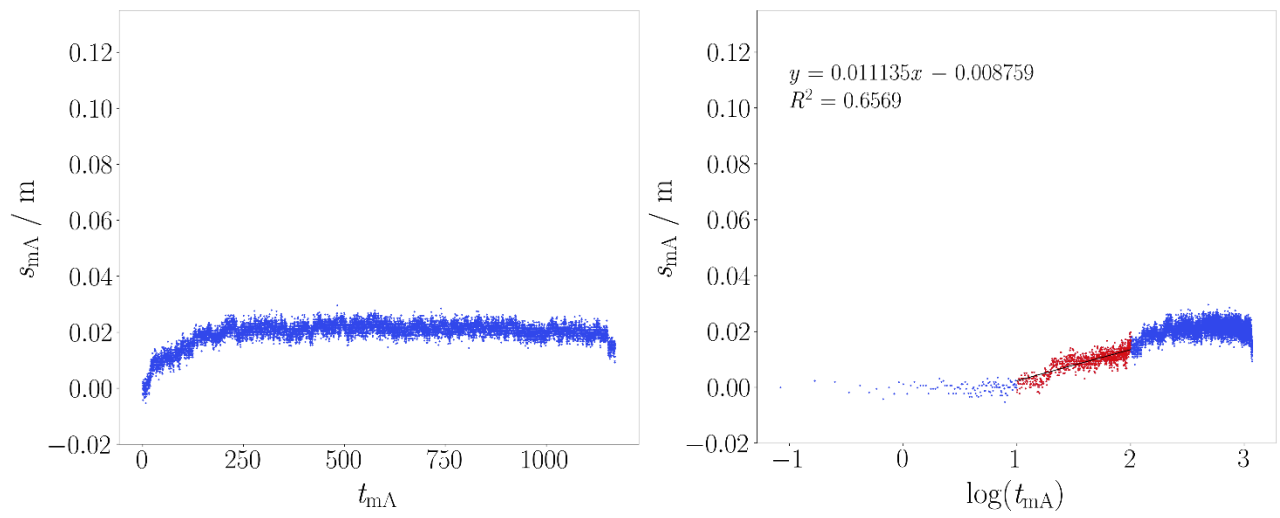
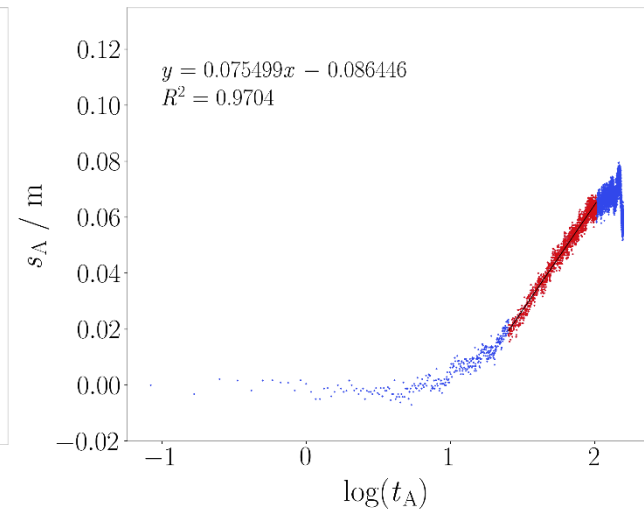
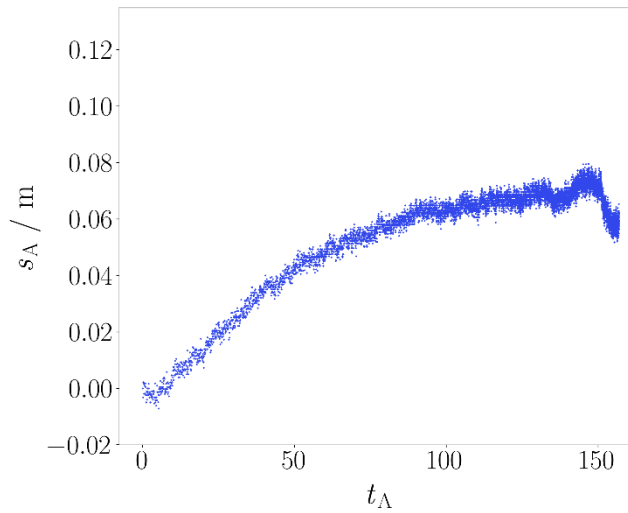
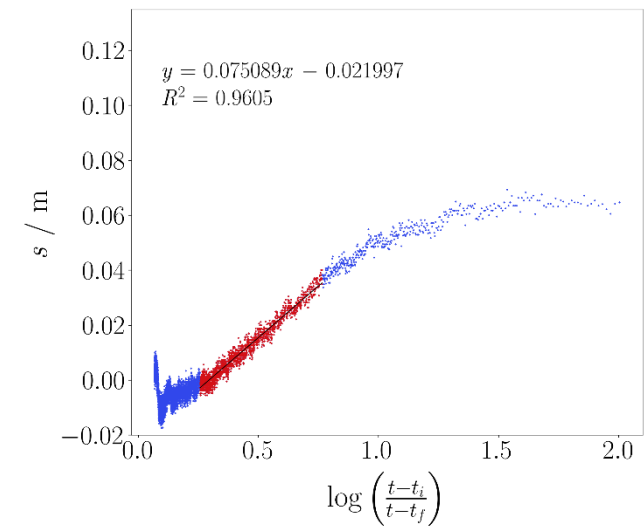
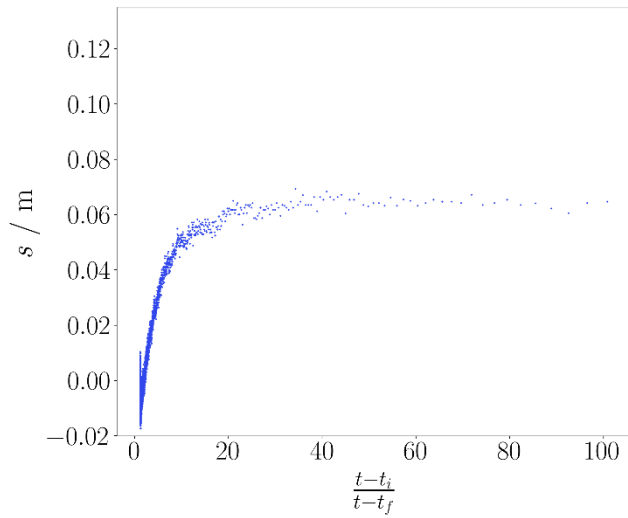
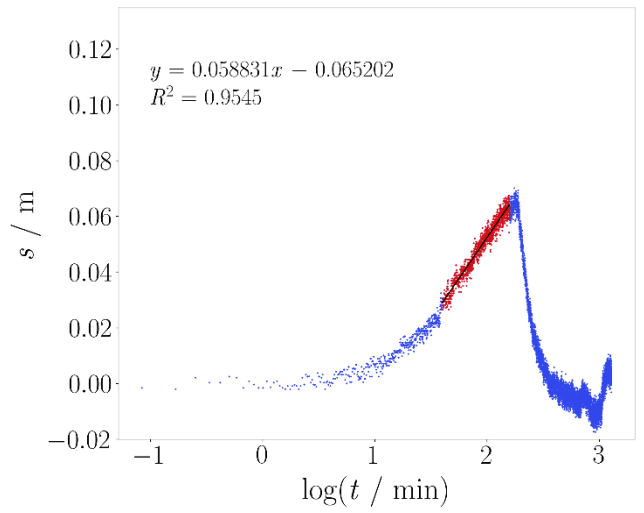
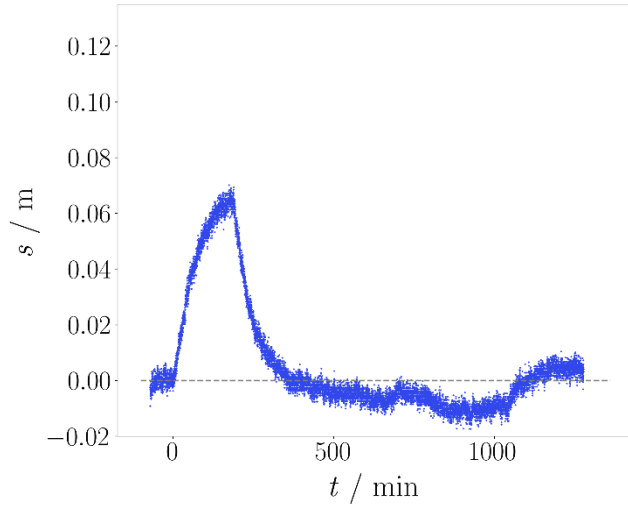


Figure A.6. Linear regression analysis of drawdown and recovery data for piezometre C1 for PT1.



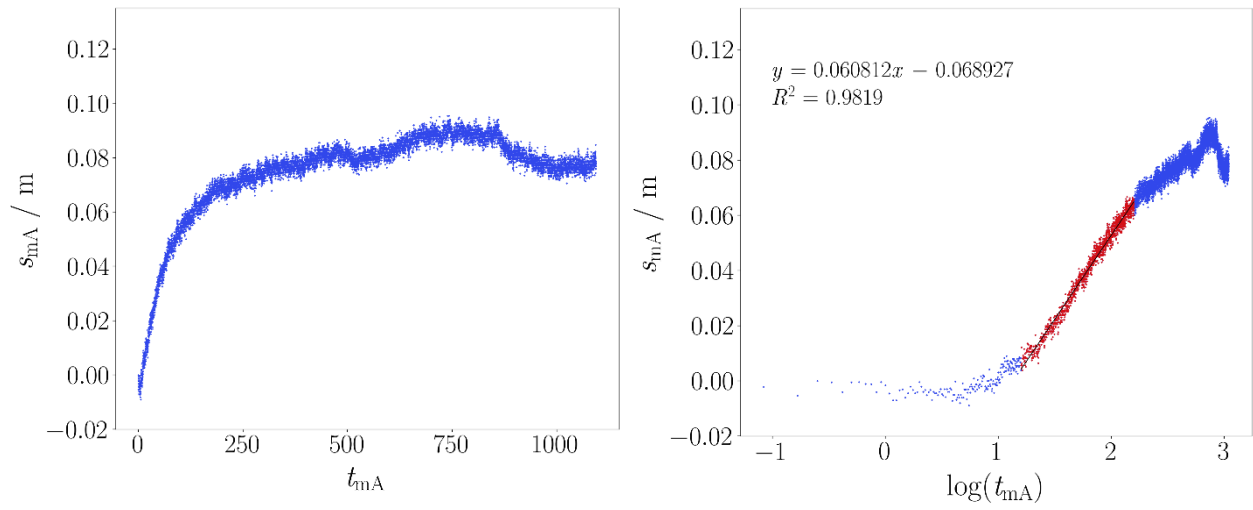
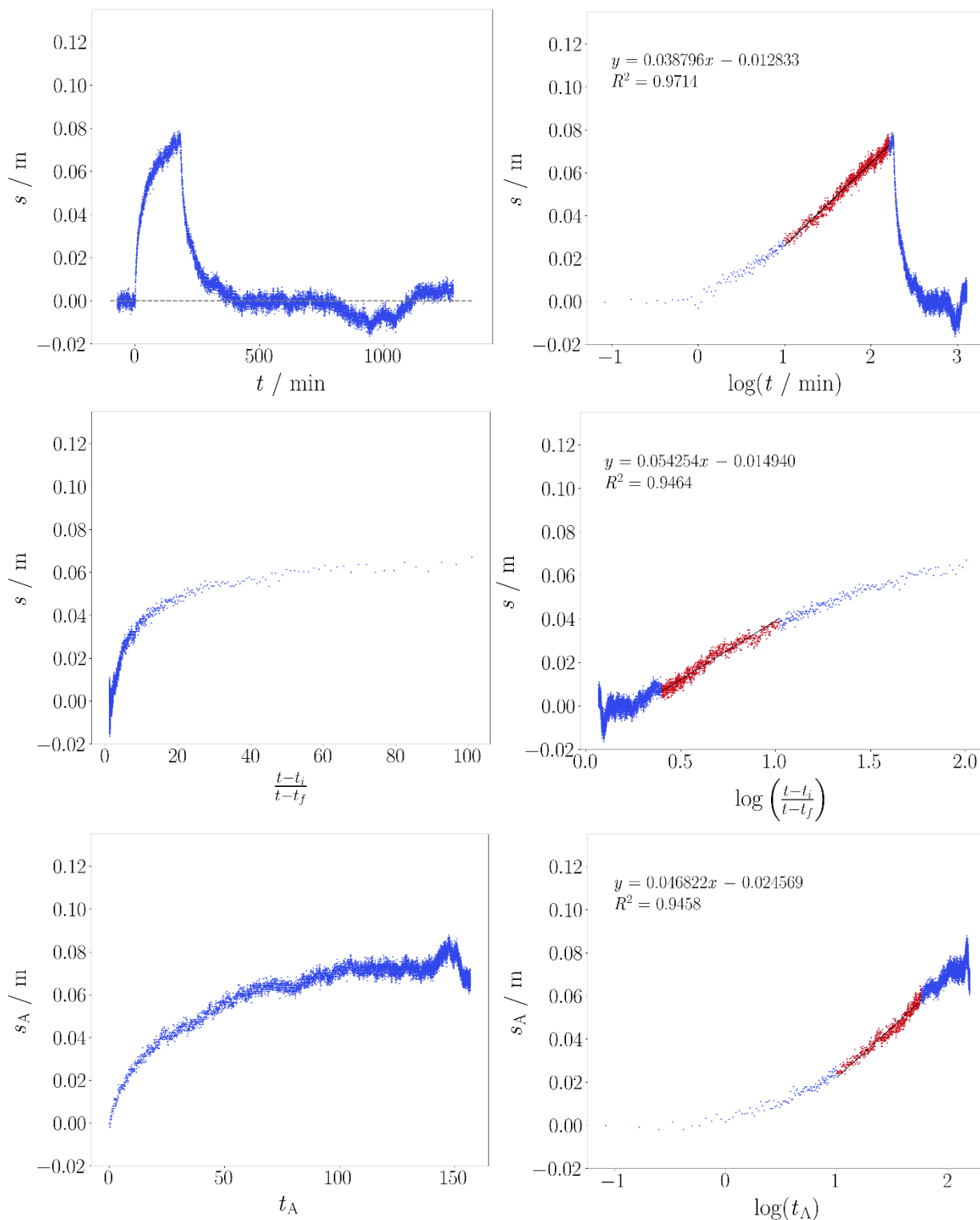


Figure A.7. Linear regression analysis of drawdown and recovery data for piezometre A3 for PT2.



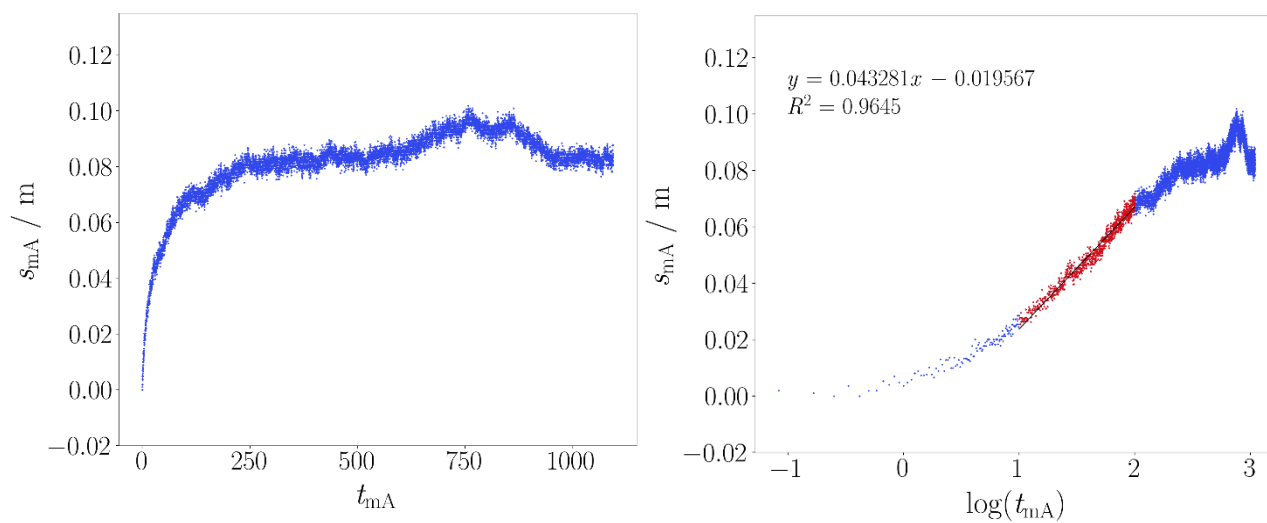
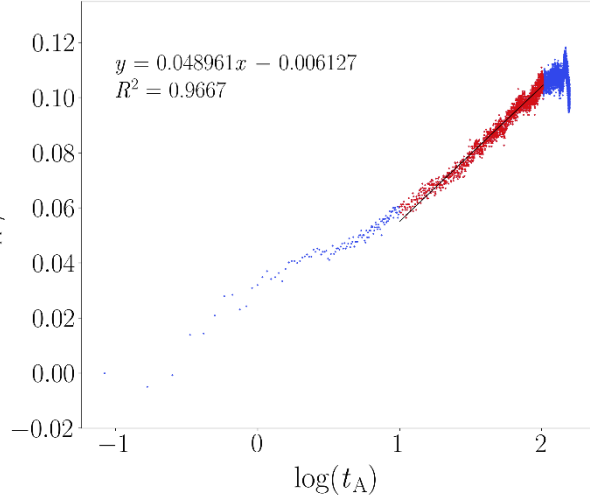
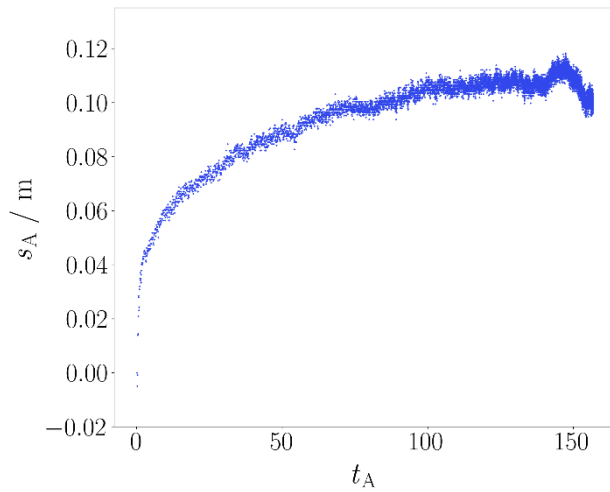
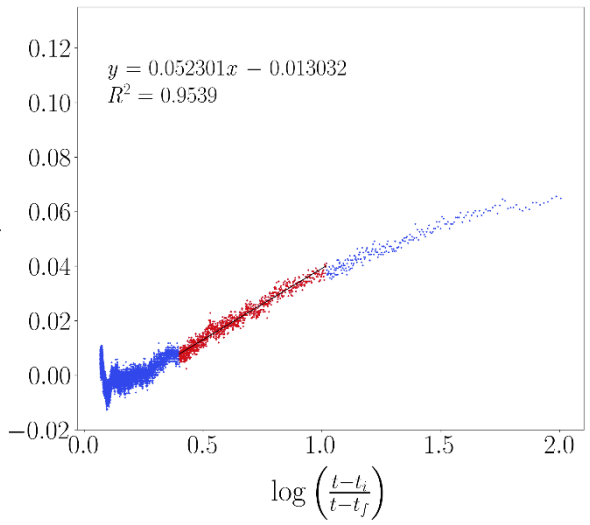
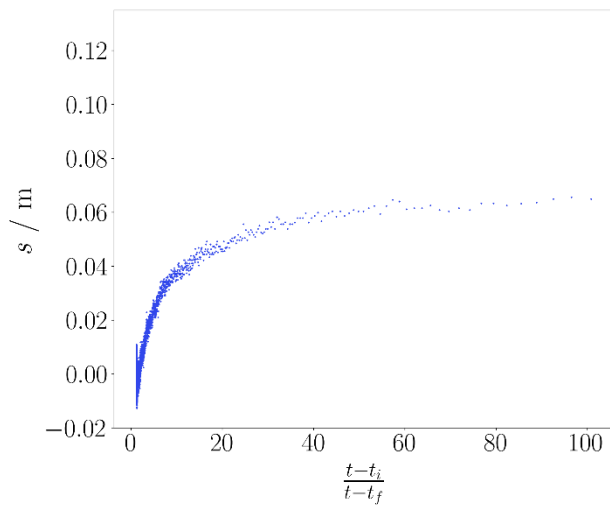
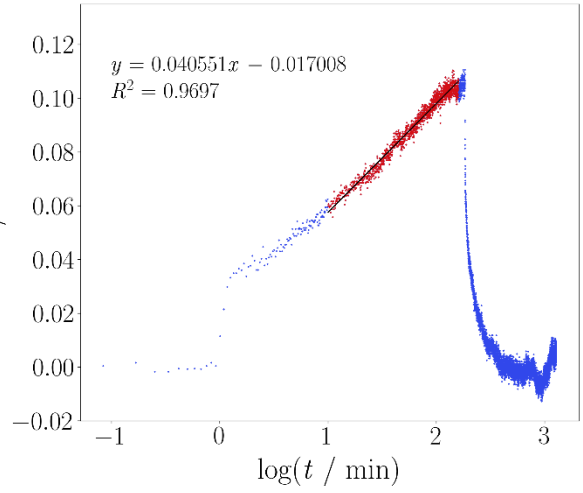
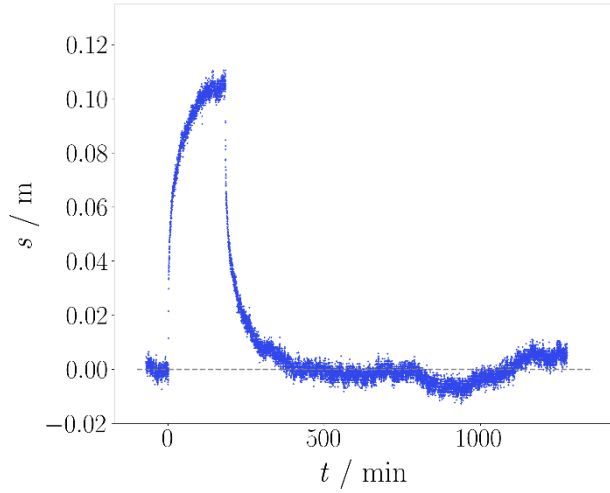


Figure A.8. Linear regression analysis of drawdown and recovery data for piezometre B1 for PT2.



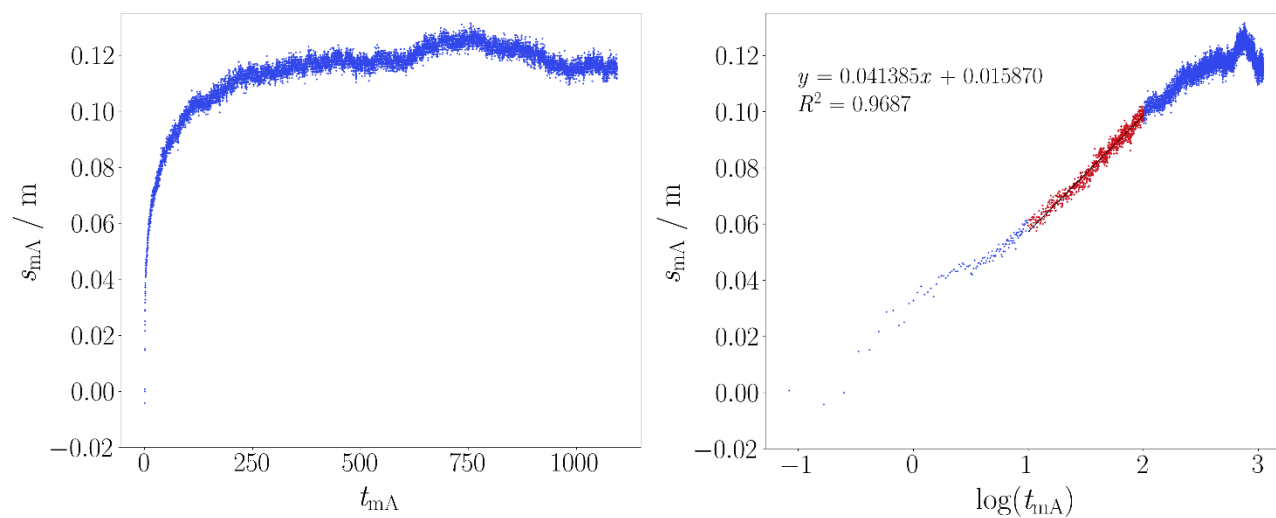
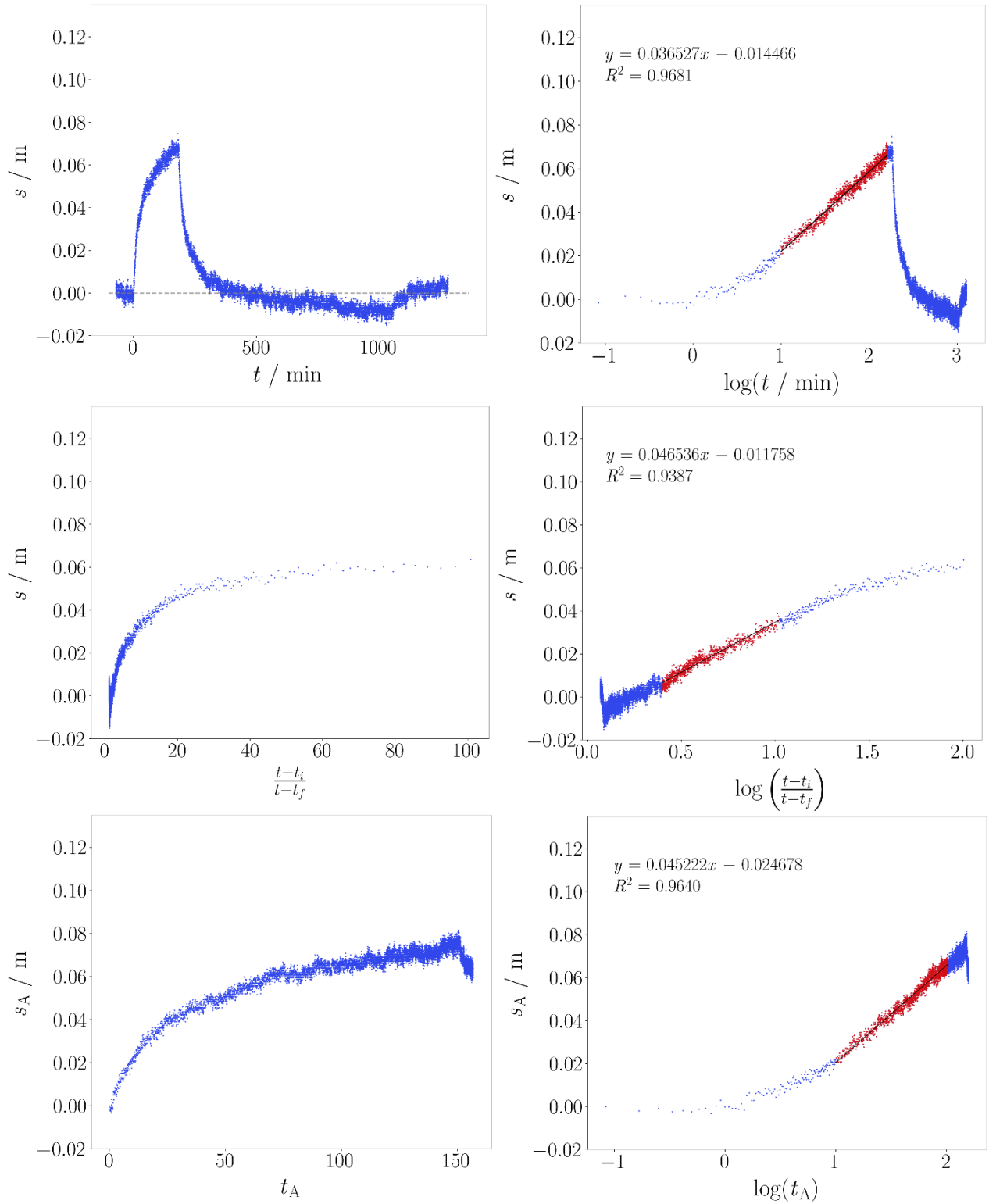


Figure A.9. Linear regression analysis of drawdown and recovery data for piezometre BCP1 for PT2.



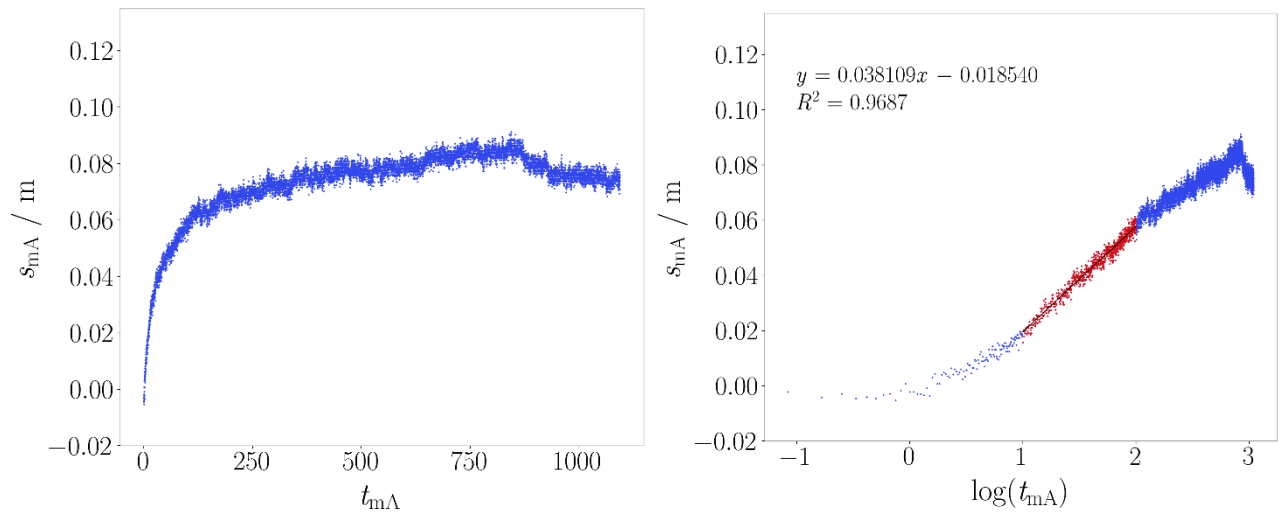
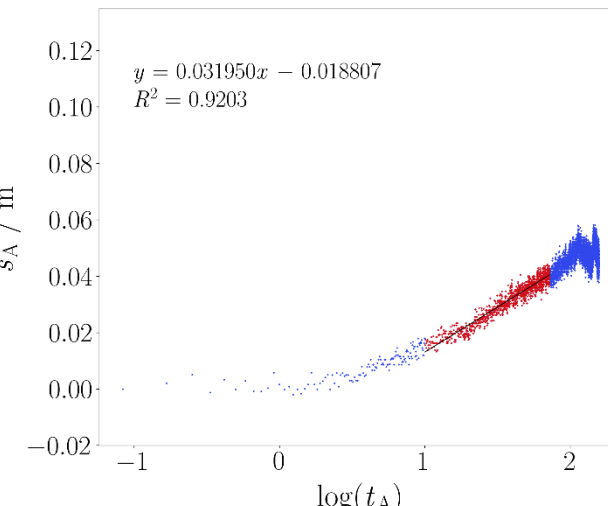
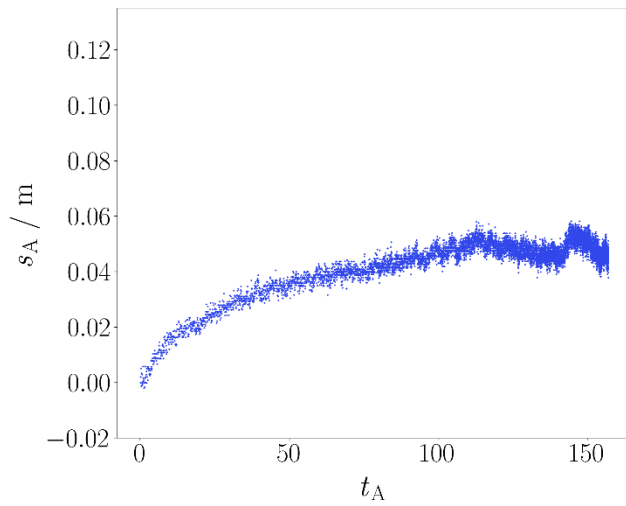
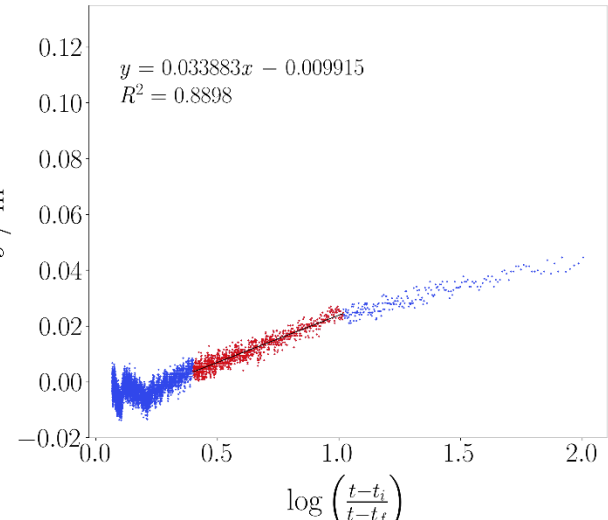
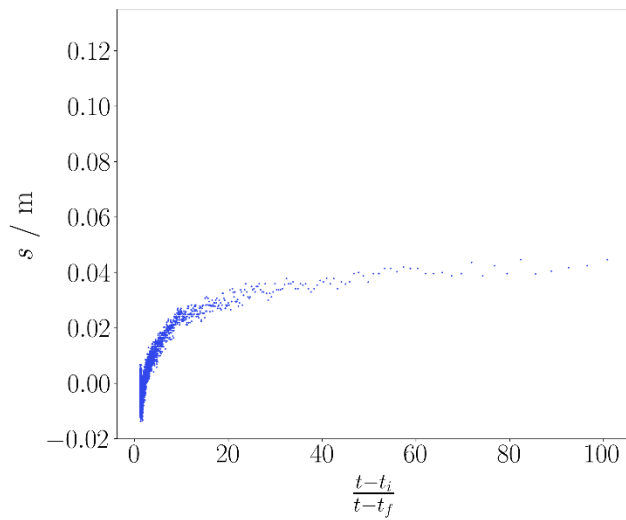
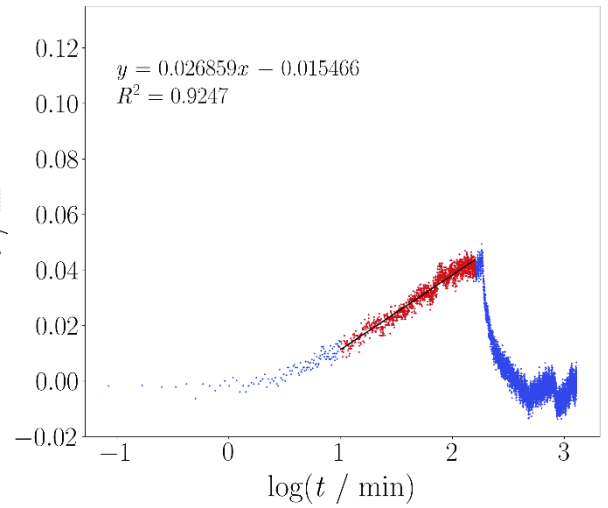
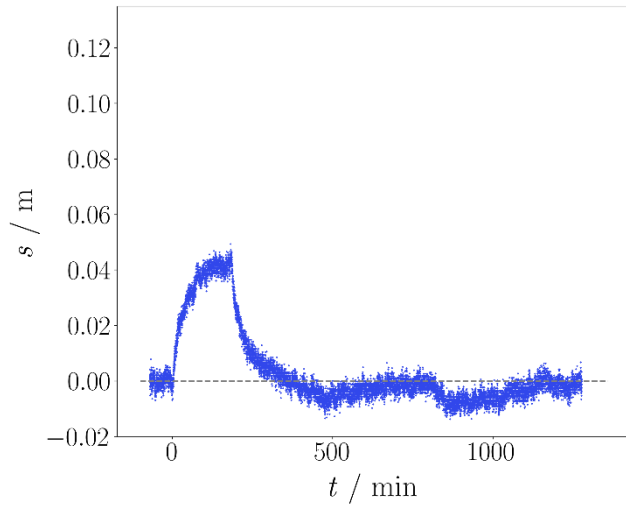


Figure A.10. Linear regression analysis of drawdown and recovery data for piezometre BCP2 for PT2.



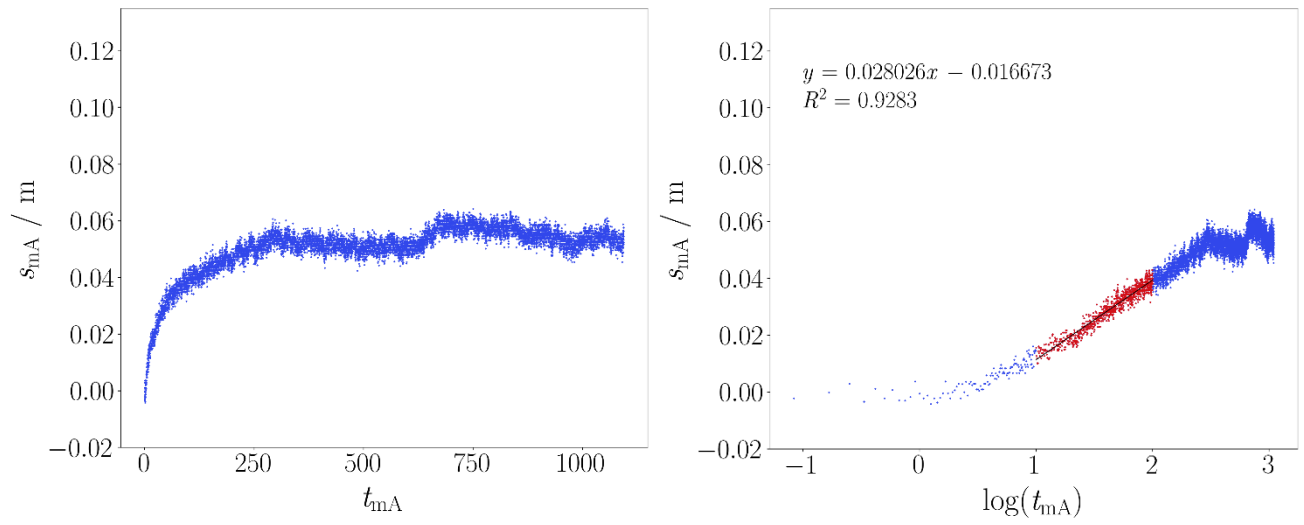
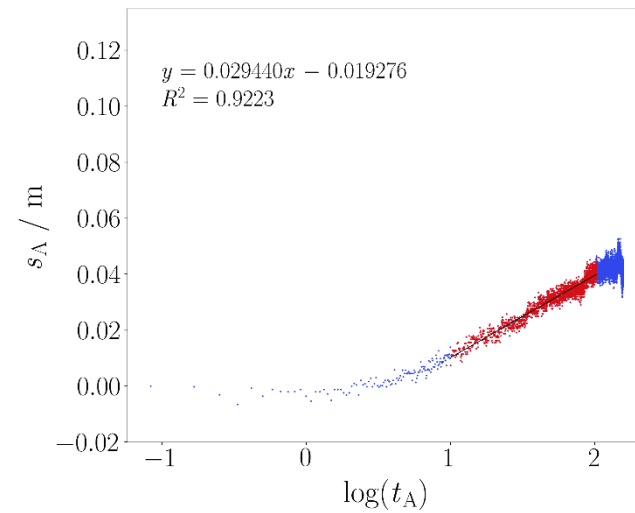
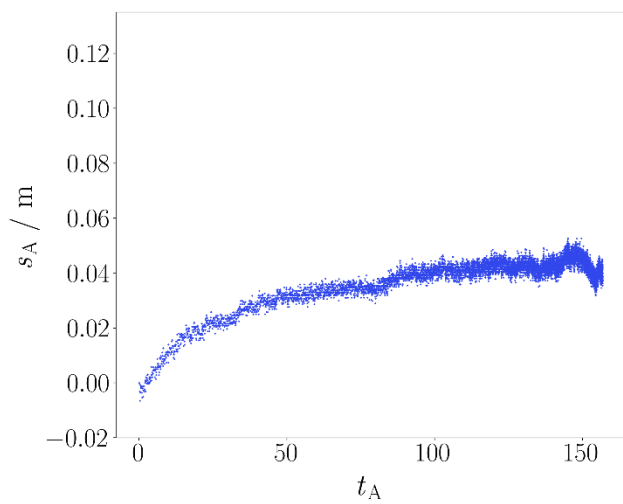
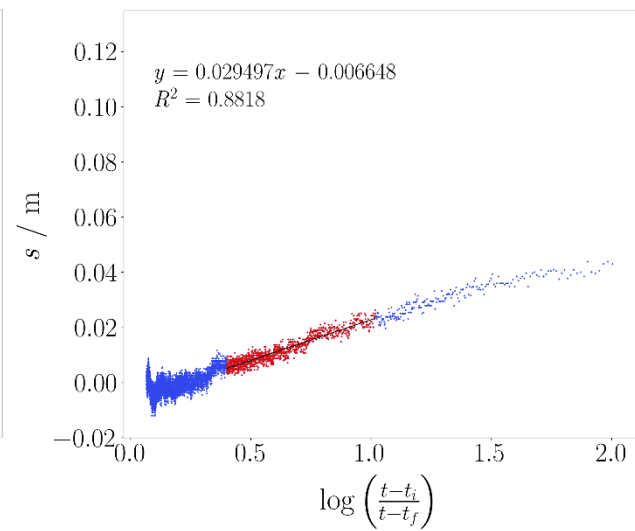
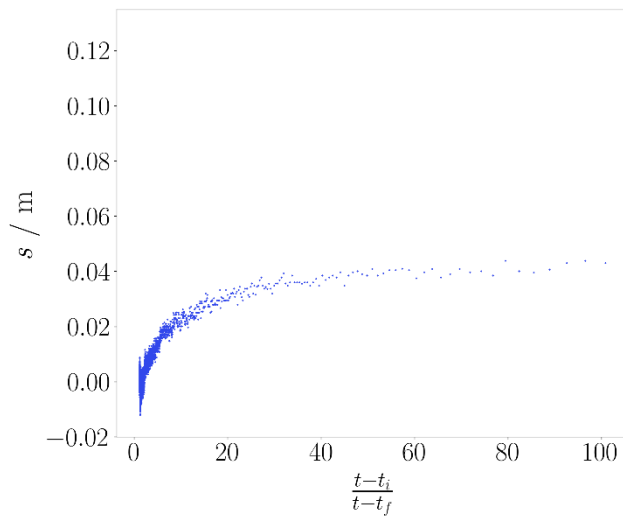
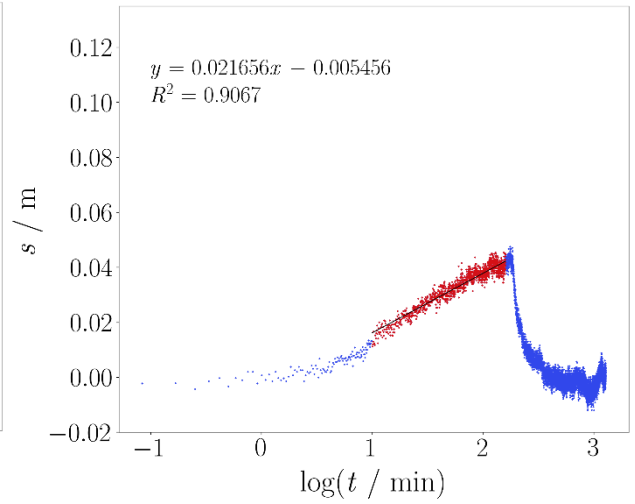
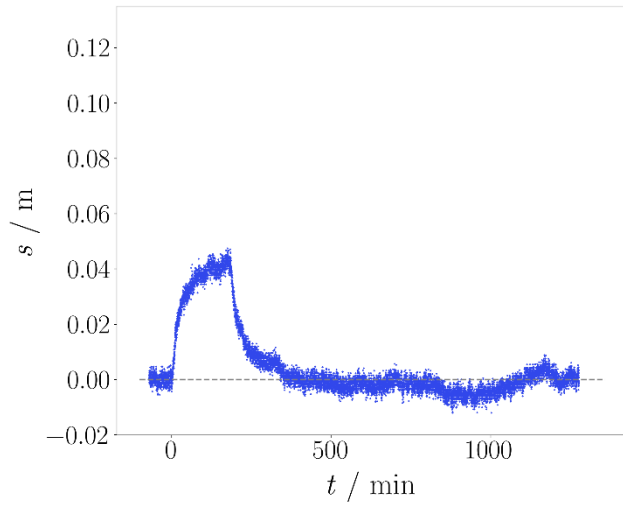


Figure A.11. Linear regression analysis of drawdown and recovery data for piezometre DCP1 for PT2.



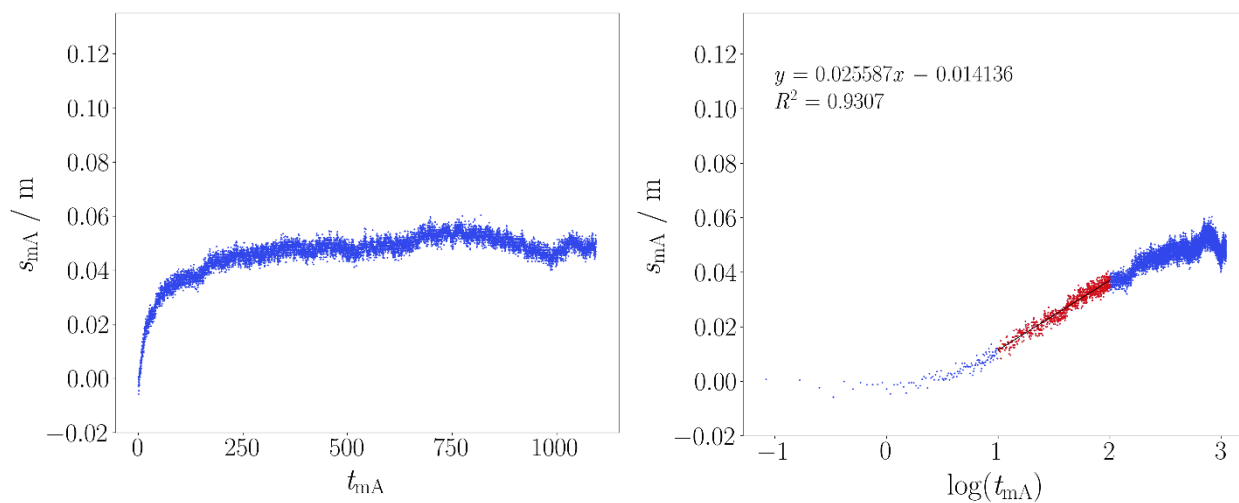
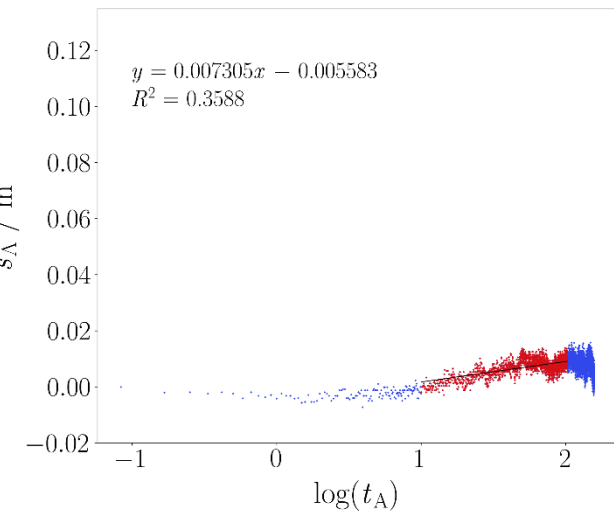
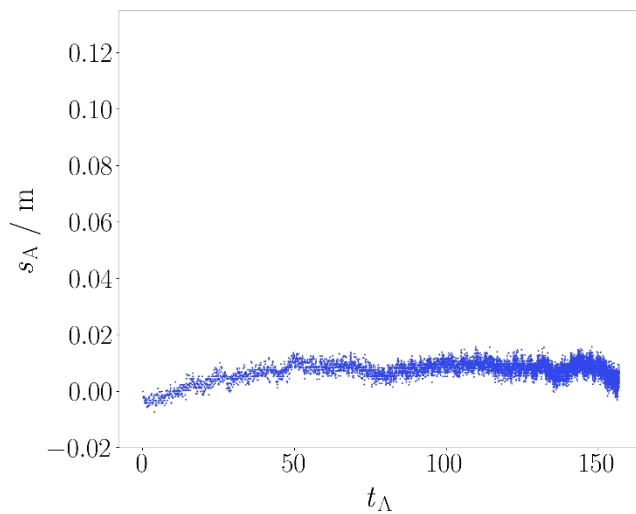
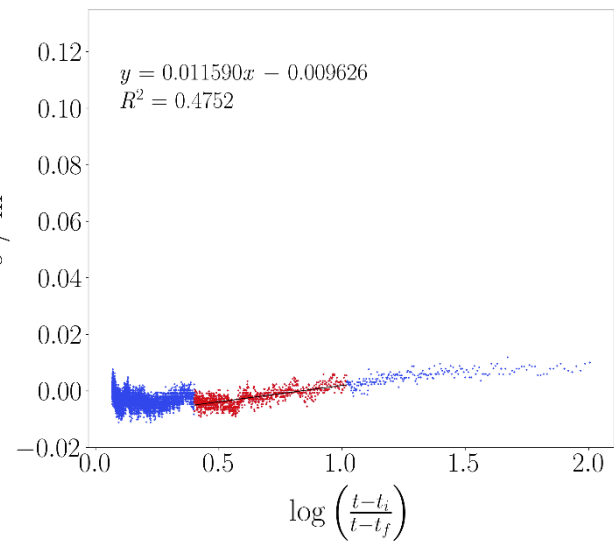
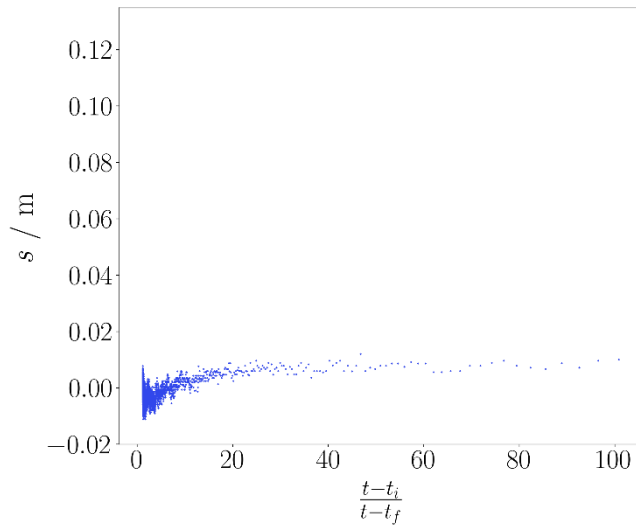
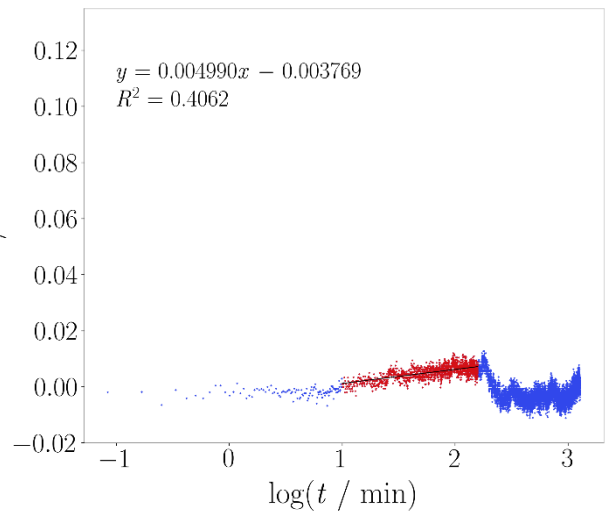
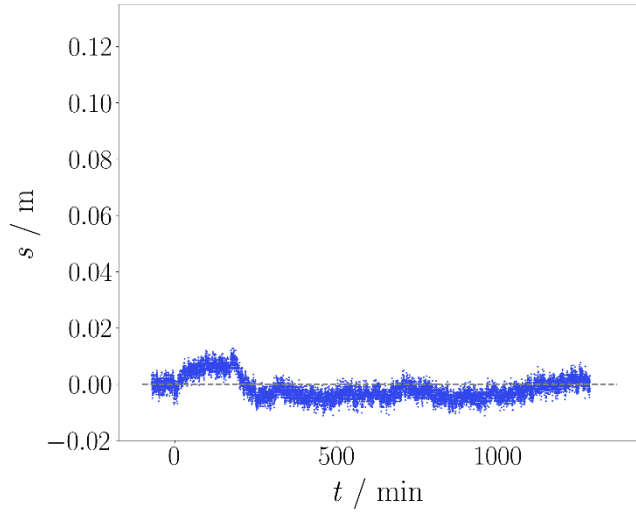


Figure A.12. Linear regression analysis of drawdown and recovery data for piezometre DCP2 for PT2.



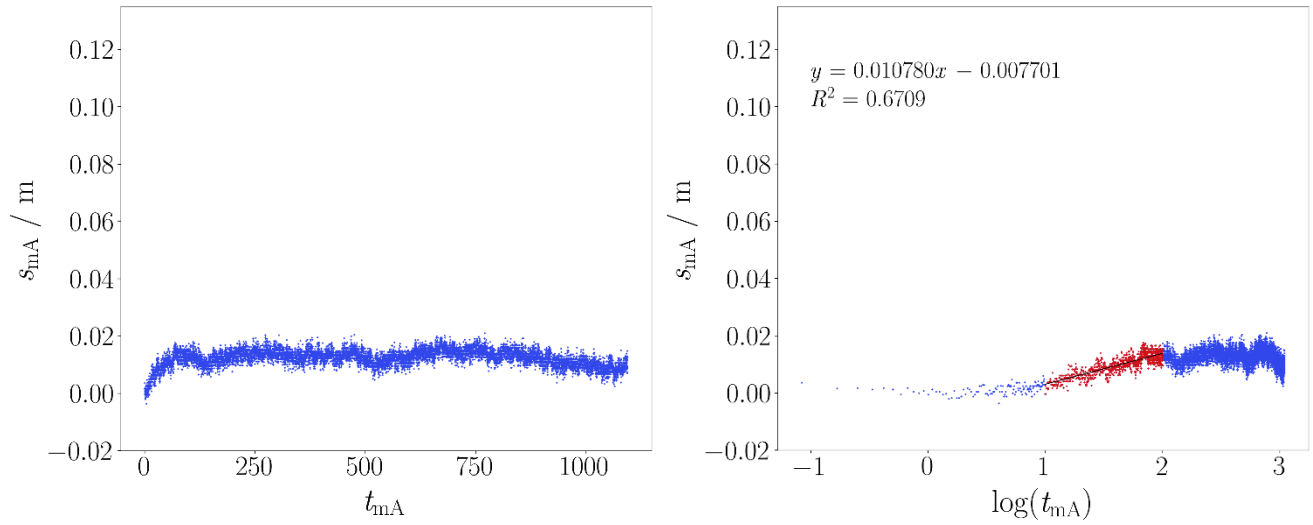


Figure A.13. Linear regression analysis of drawdown and recovery data for piezometre C1 for PT2.

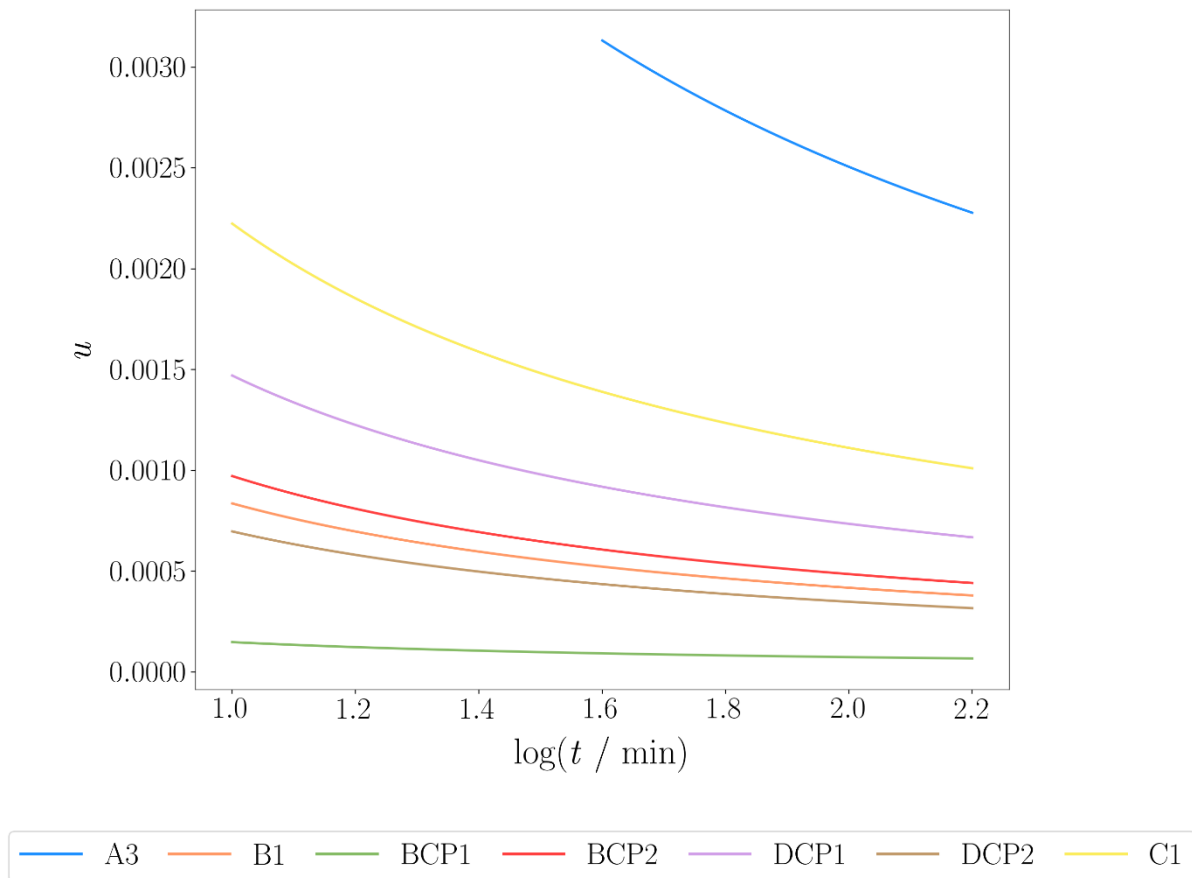


Figure A.14. Plot of u versus $\log(t)$ for the data used in the drawdown analysis of pumping test 2, to demonstrate the validity of the range of datapoints selected.

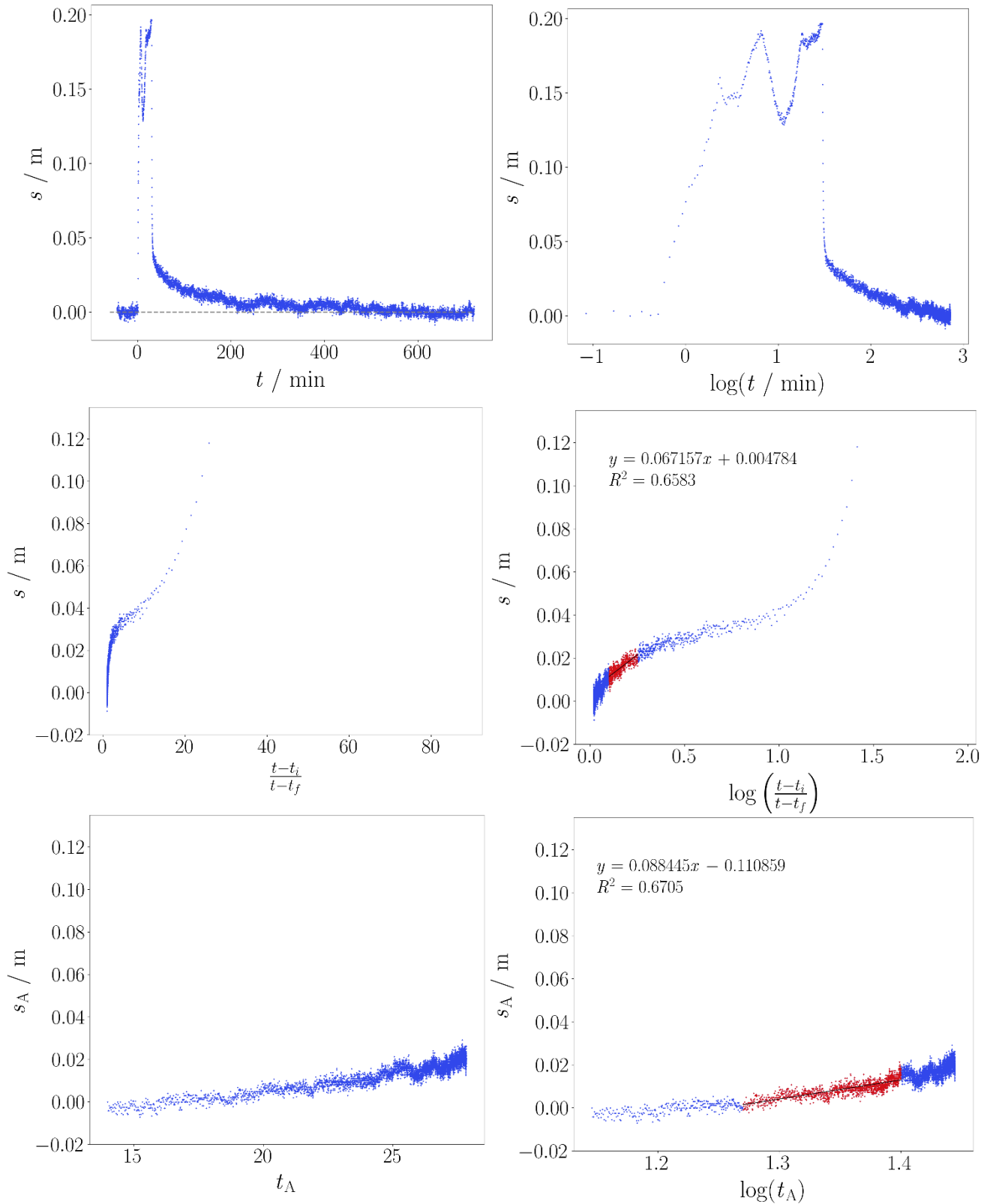
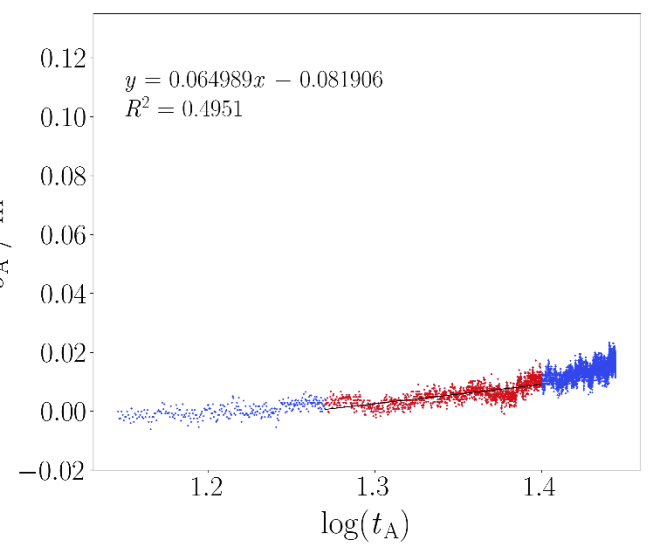
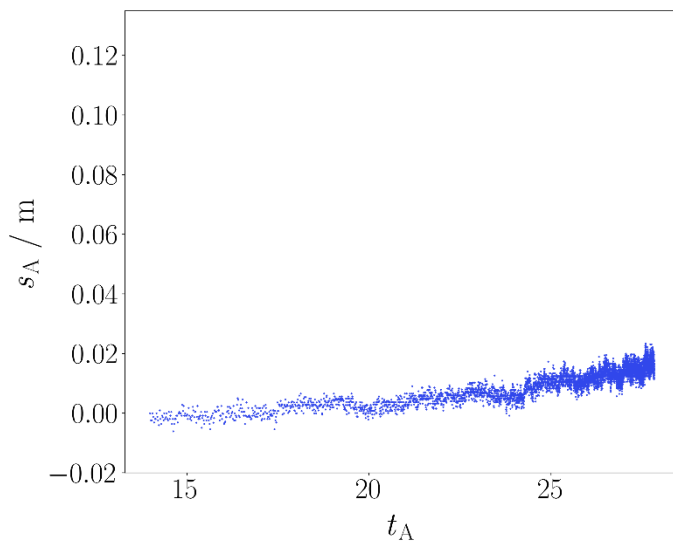
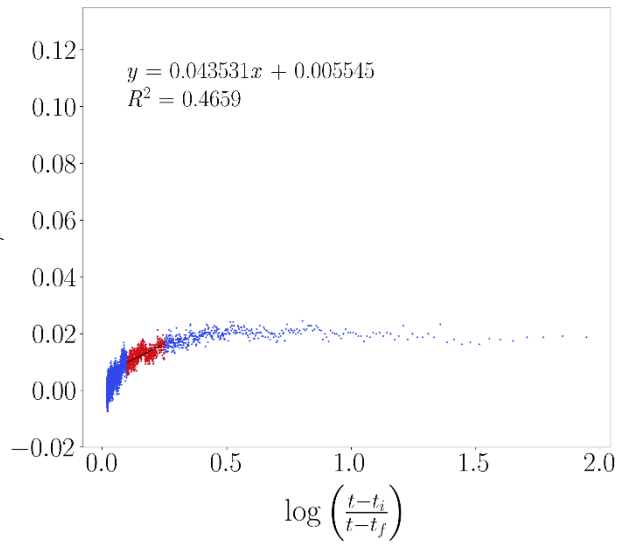
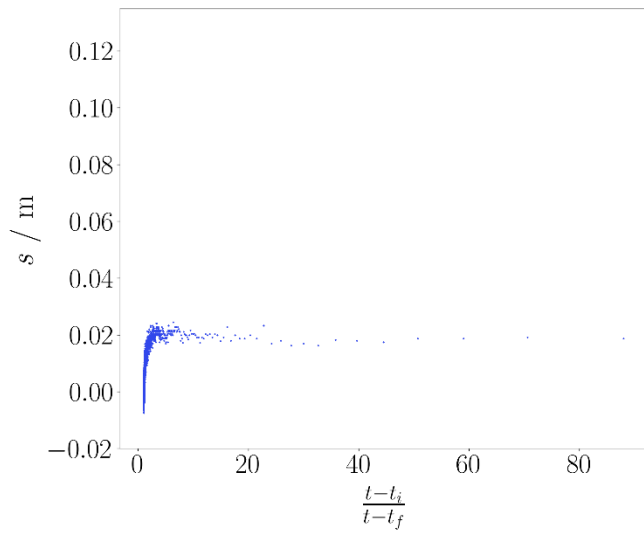
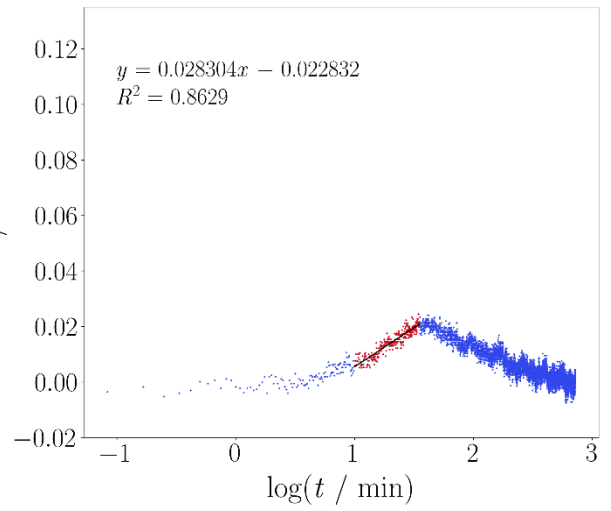
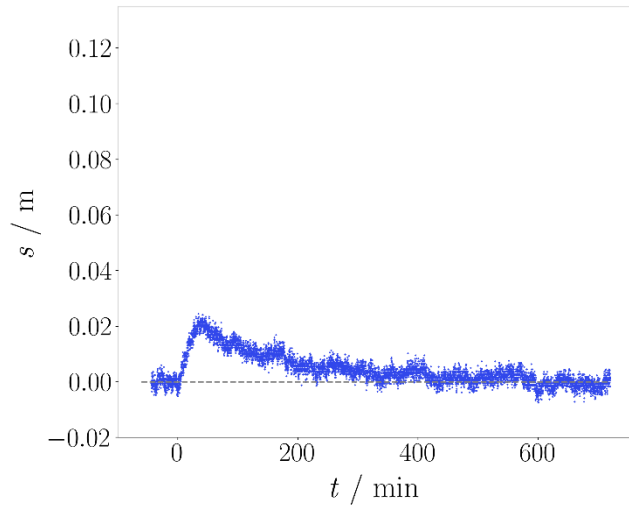


Figure A.15. Linear regression analysis of drawdown and recovery data for piezometre A3 for PT3.



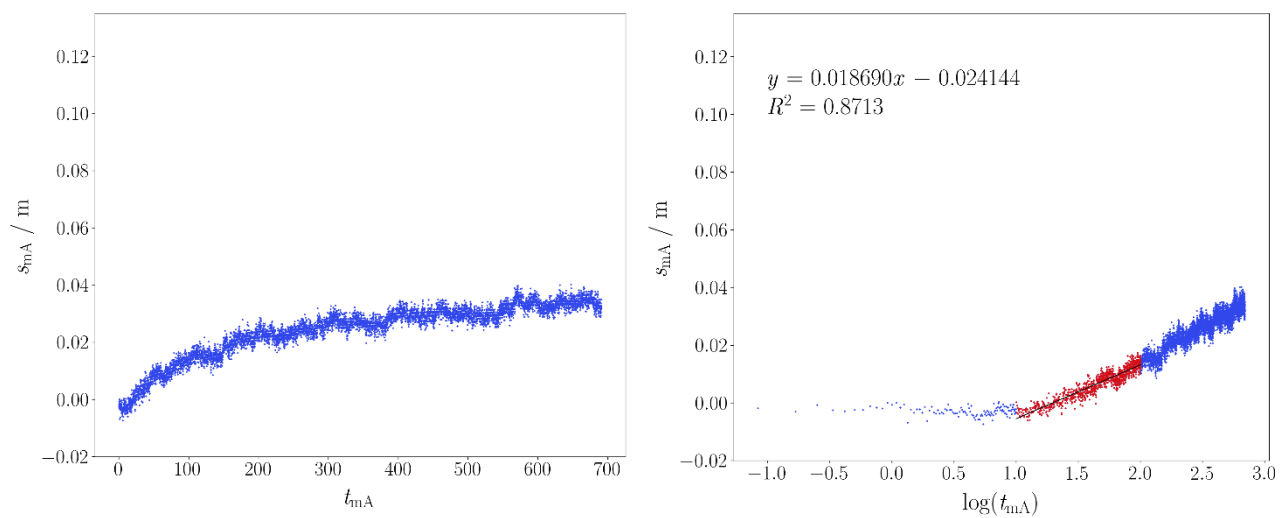
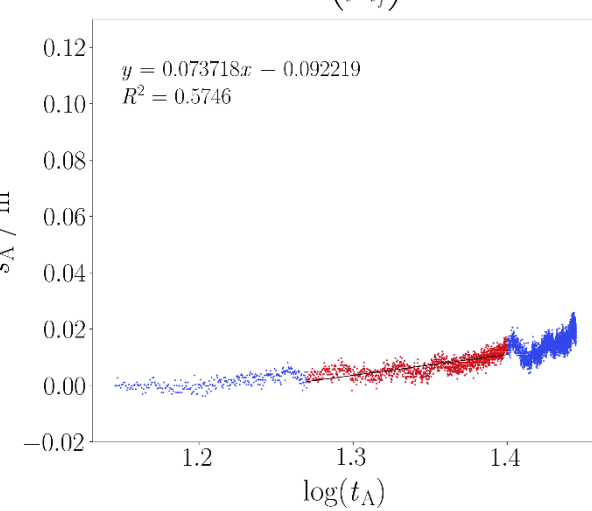
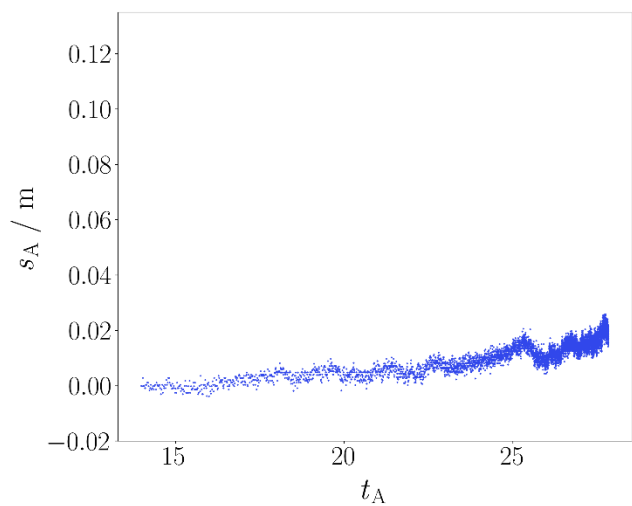
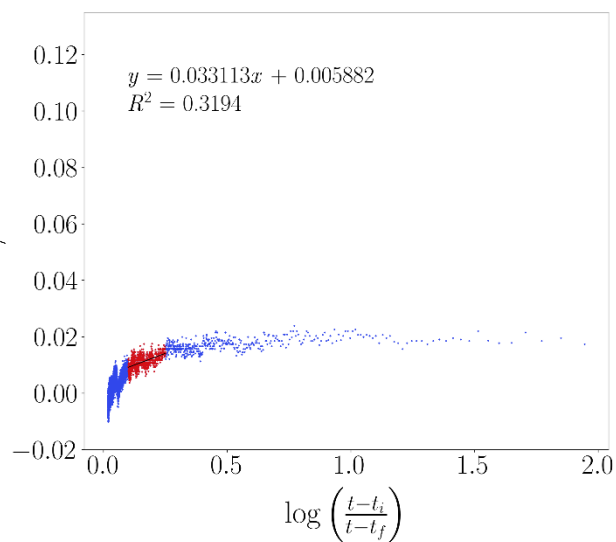
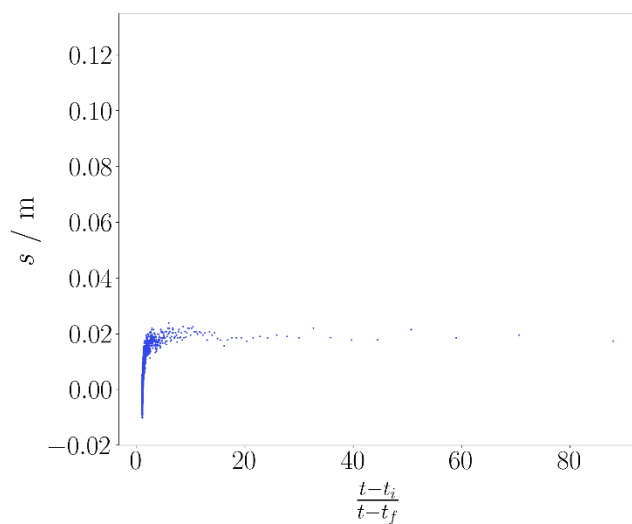
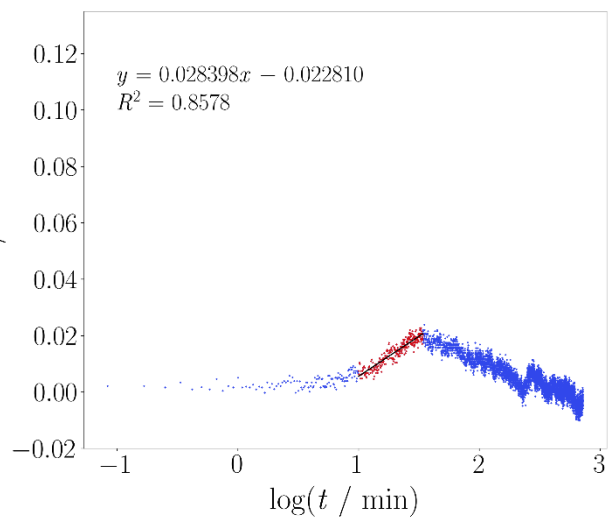
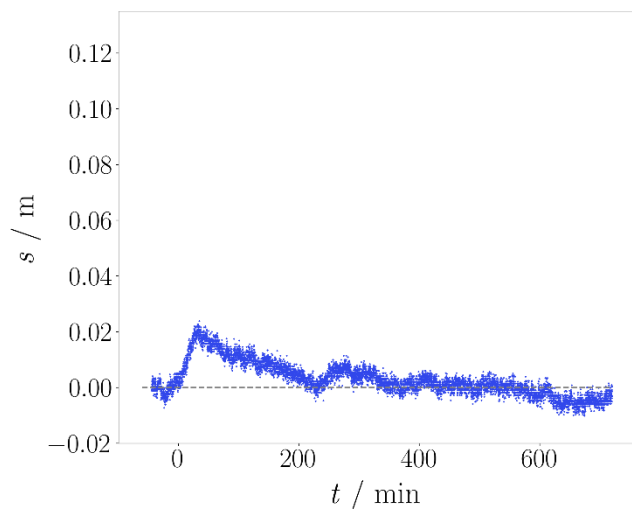


Figure A.16. Linear regression analysis of drawdown and recovery data for piezometre B1 for PT3.



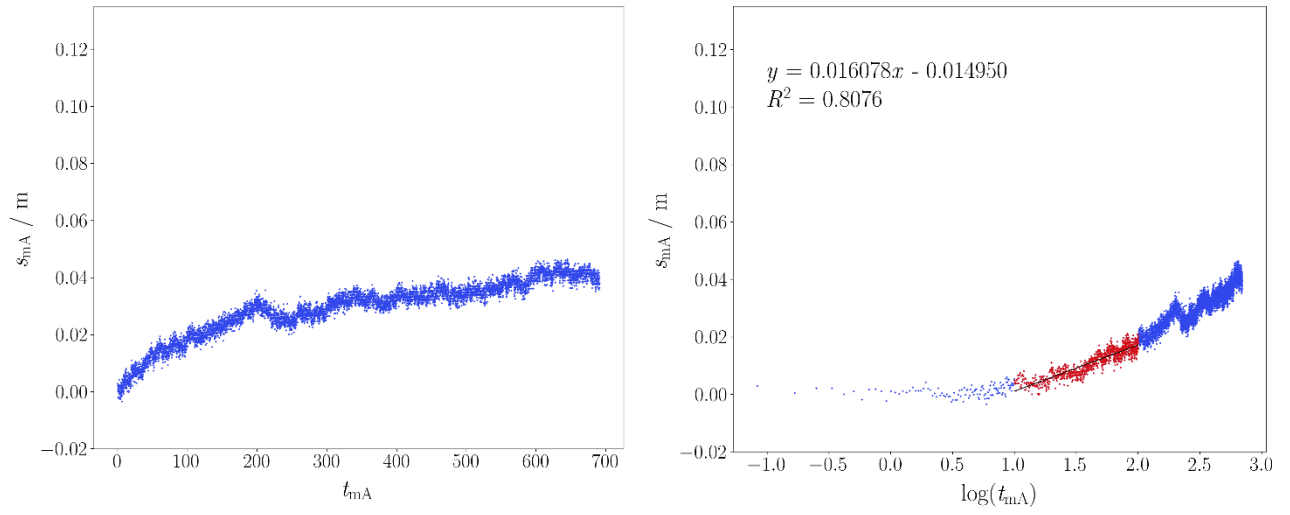
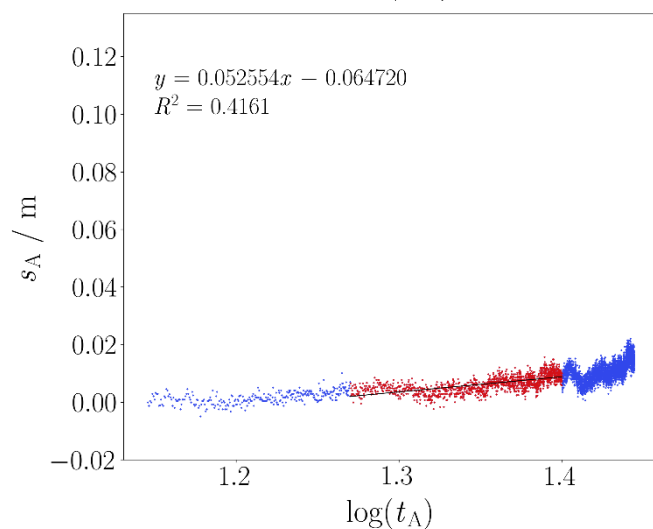
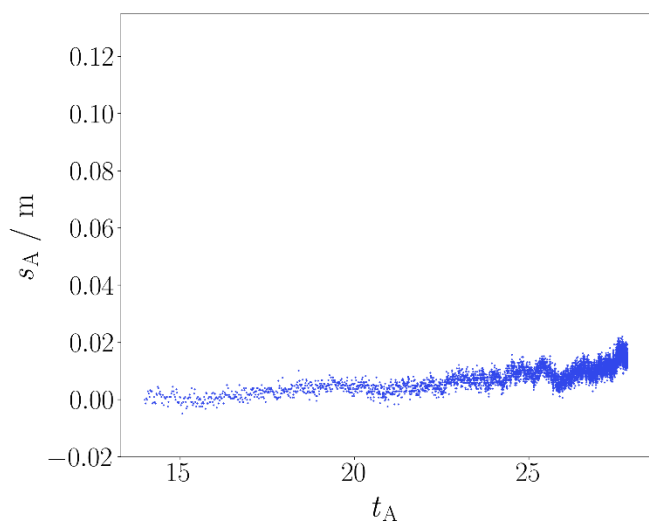
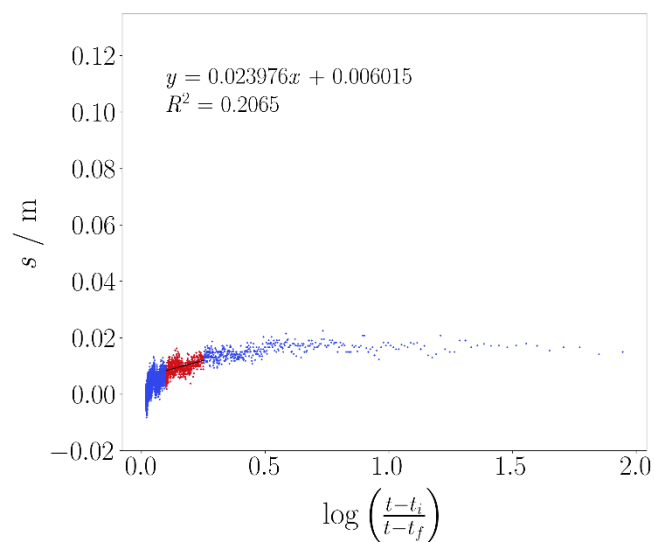
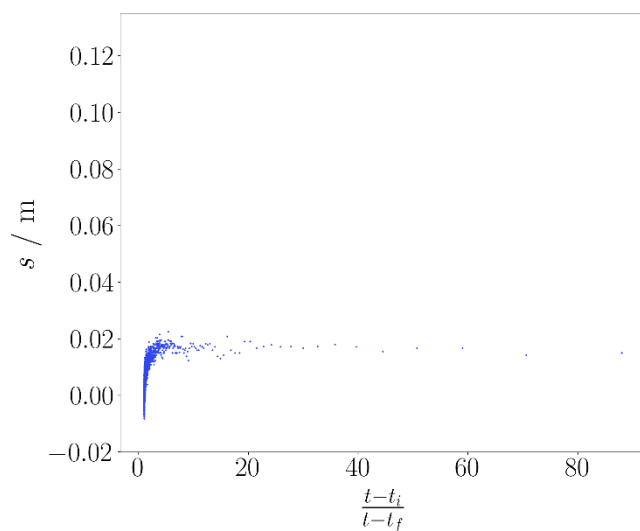
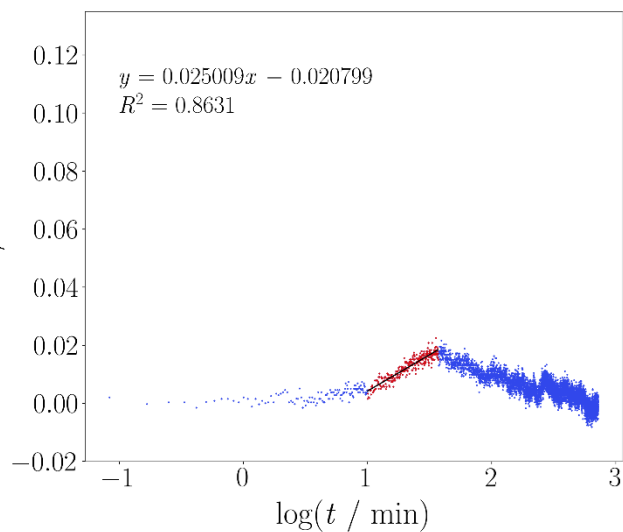
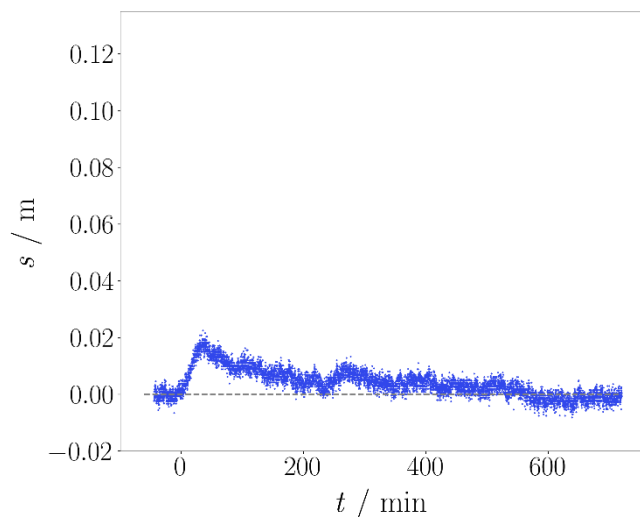


Figure A.17. Linear regression analysis of drawdown and recovery data for piezometre BCP1 for PT3.



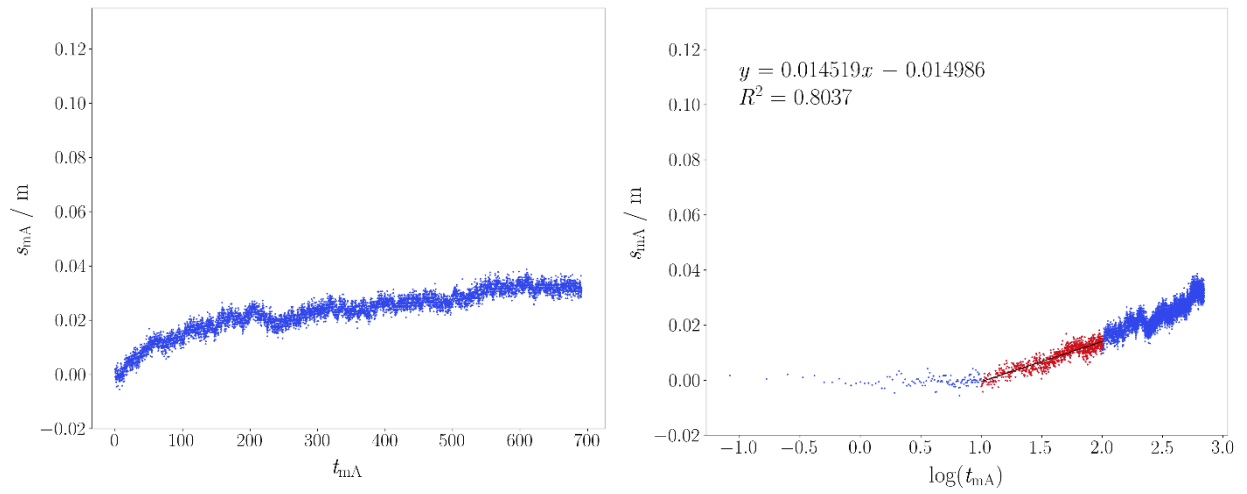
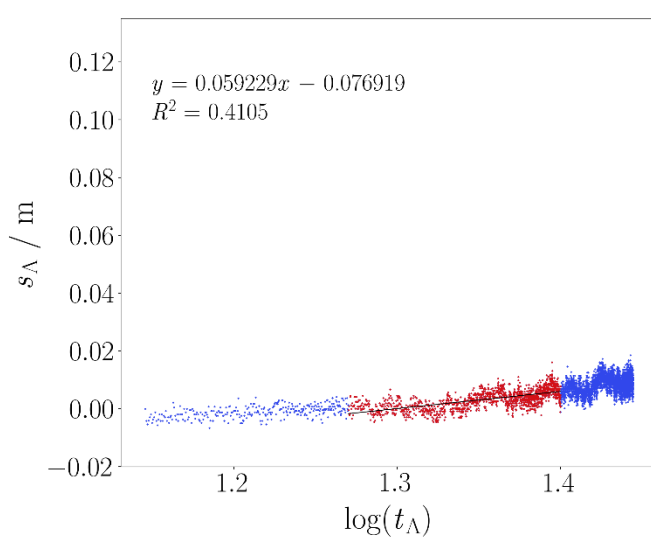
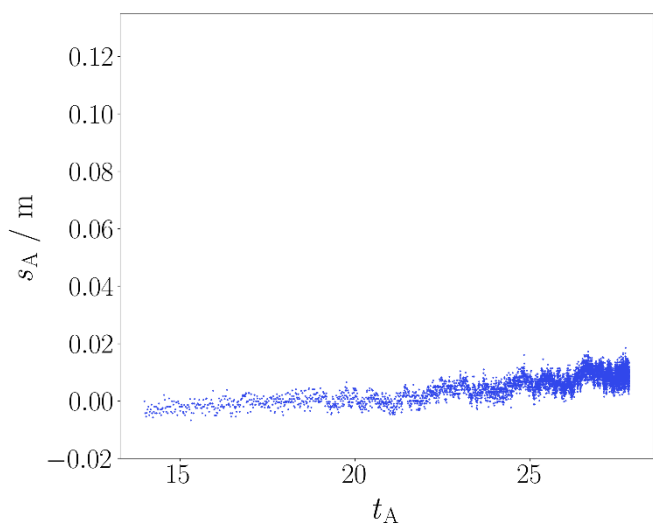
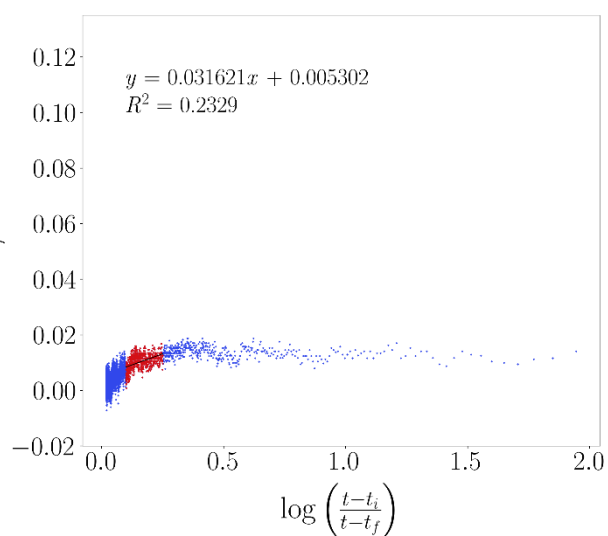
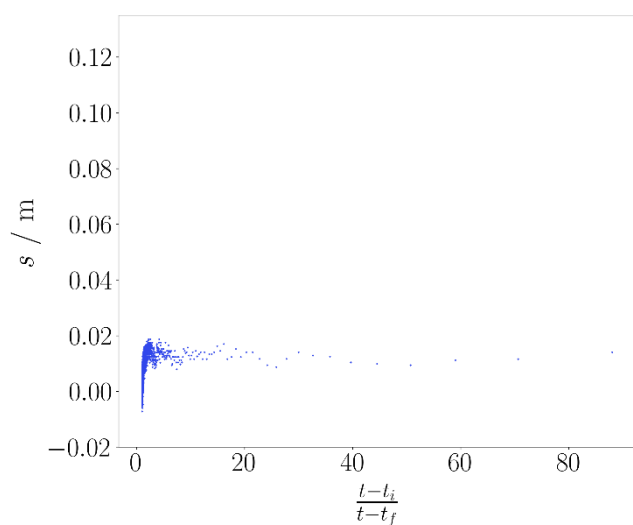
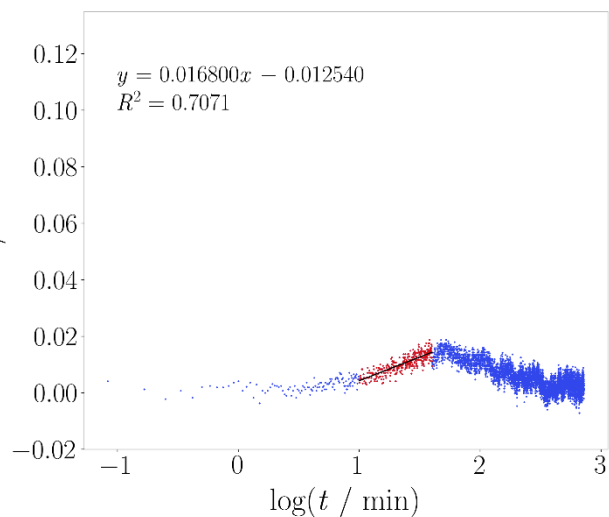
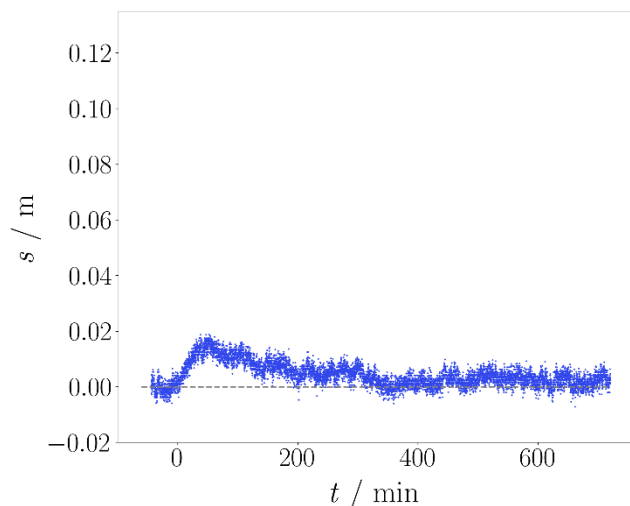


Figure A.18. Linear regression analysis of drawdown and recovery data for piezometre BCP2 for PT3.



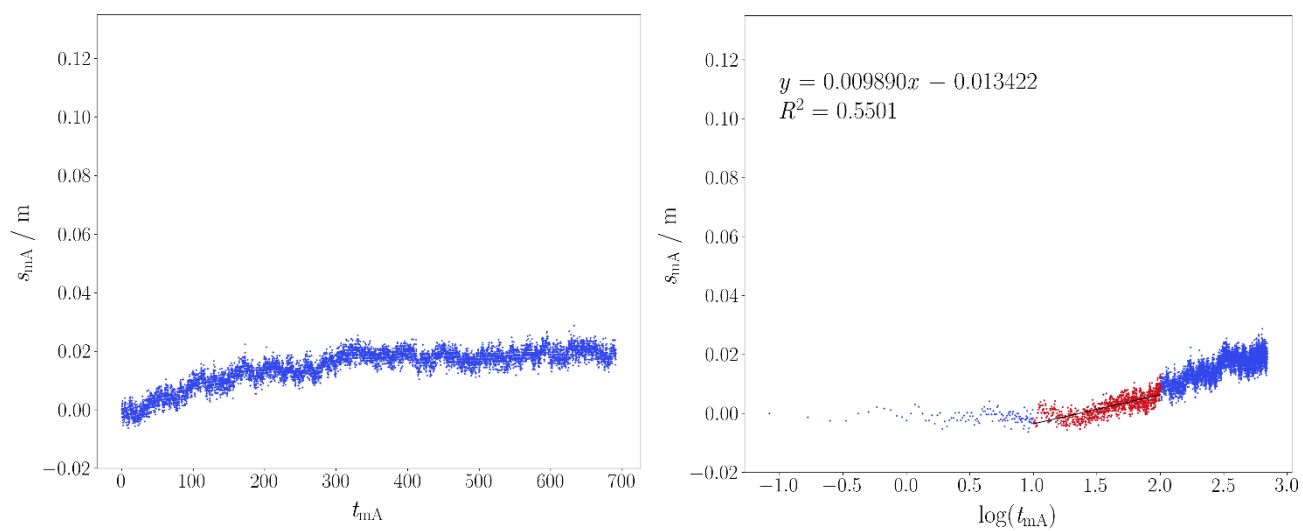
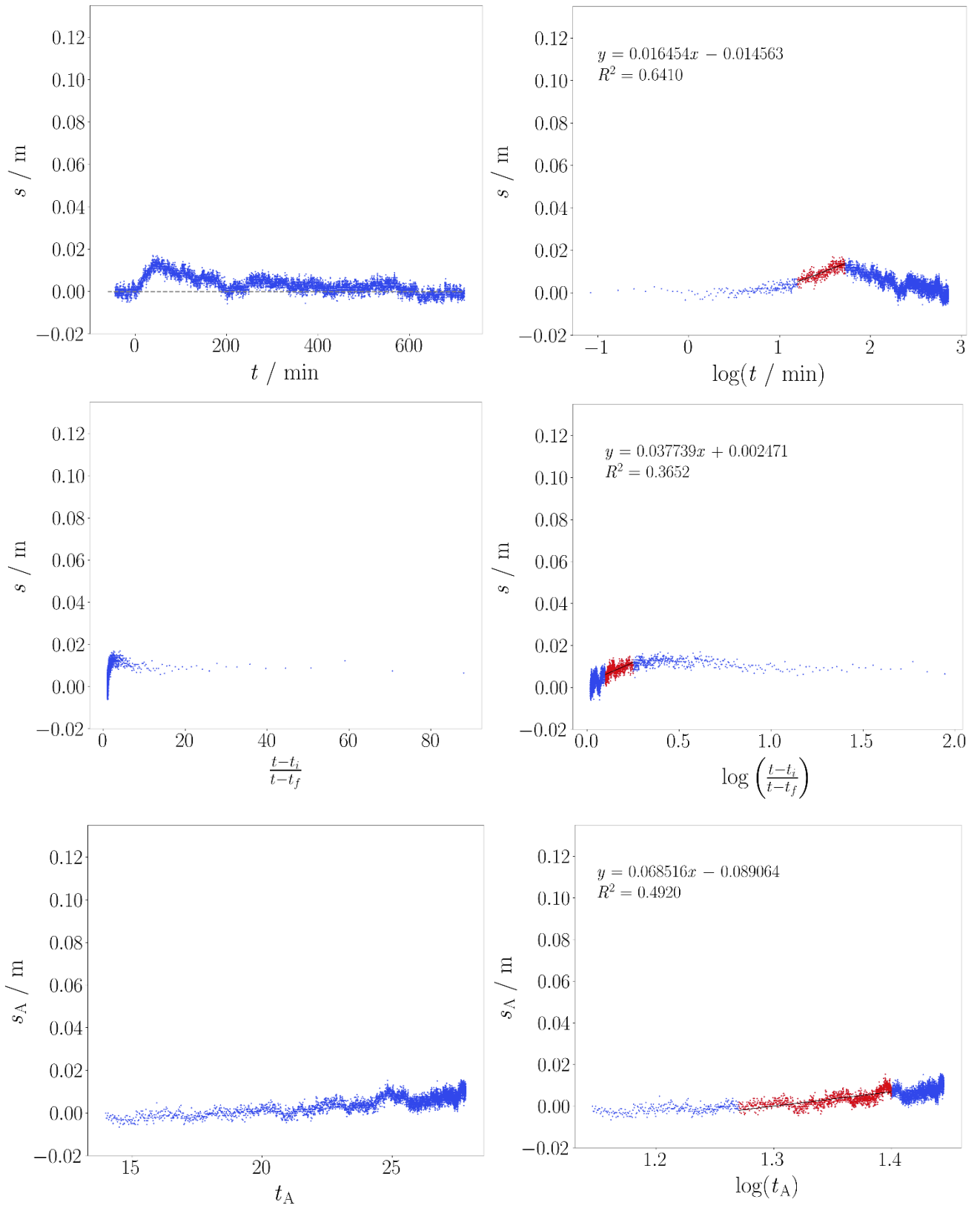


Figure A.19. Linear regression analysis of drawdown and recovery data for piezometre DCP1 for PT3.



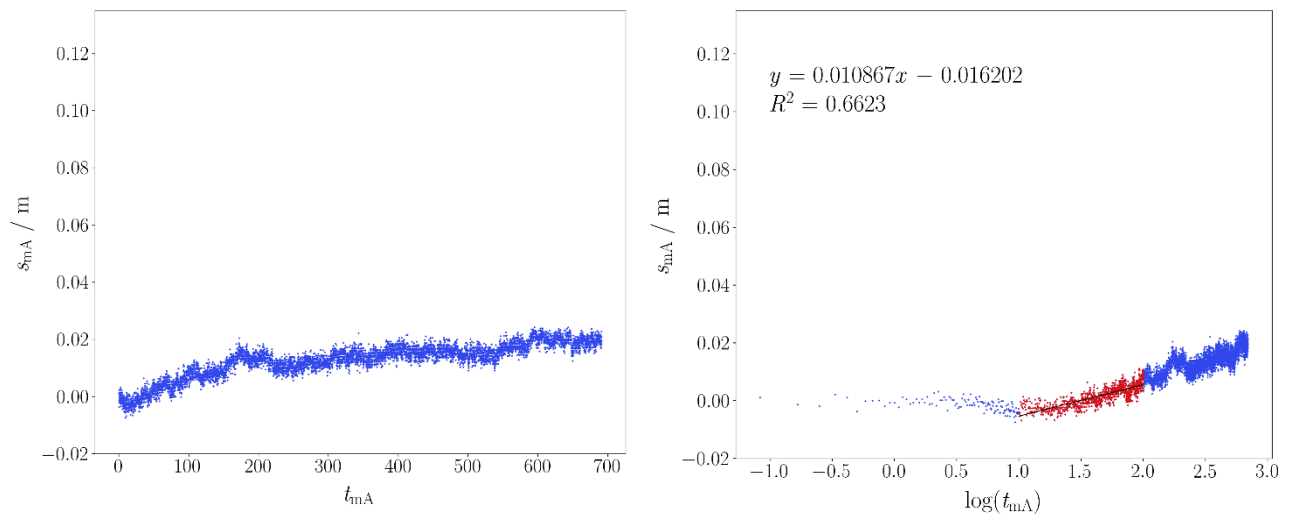
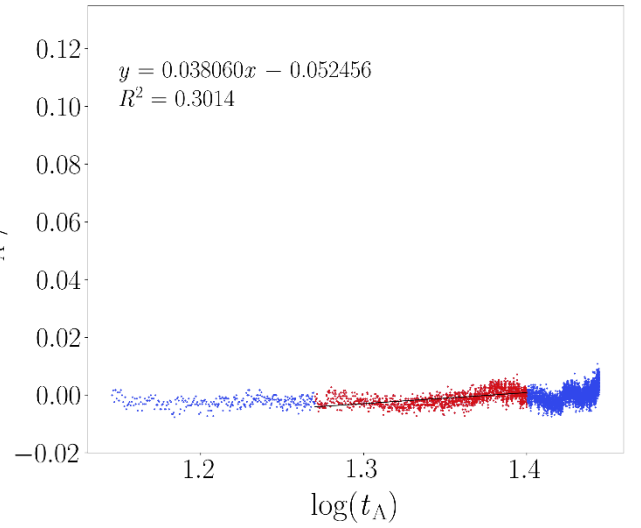
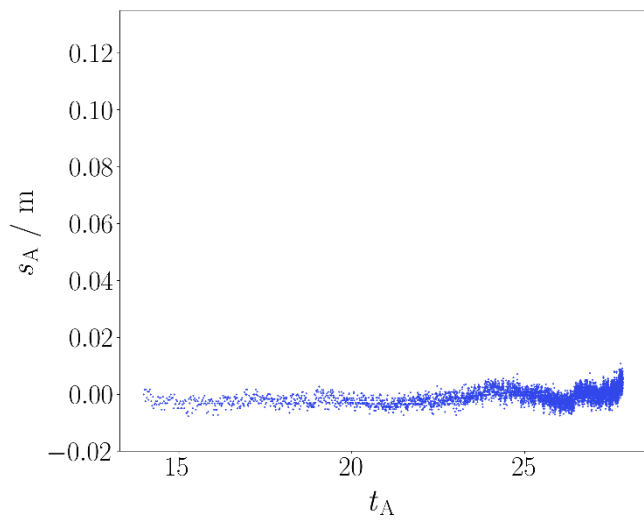
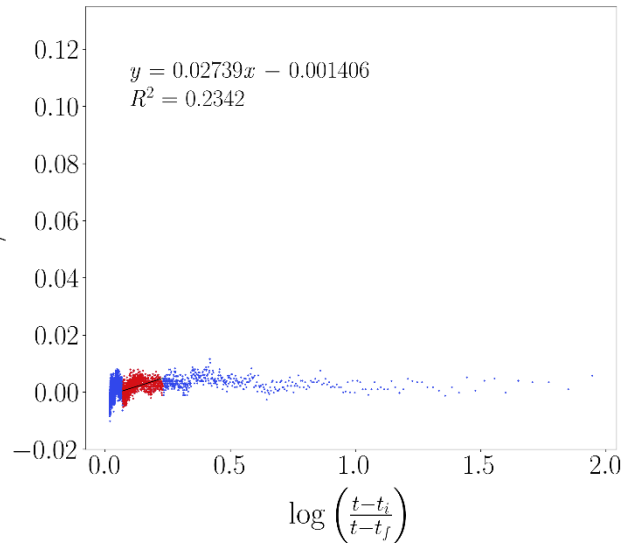
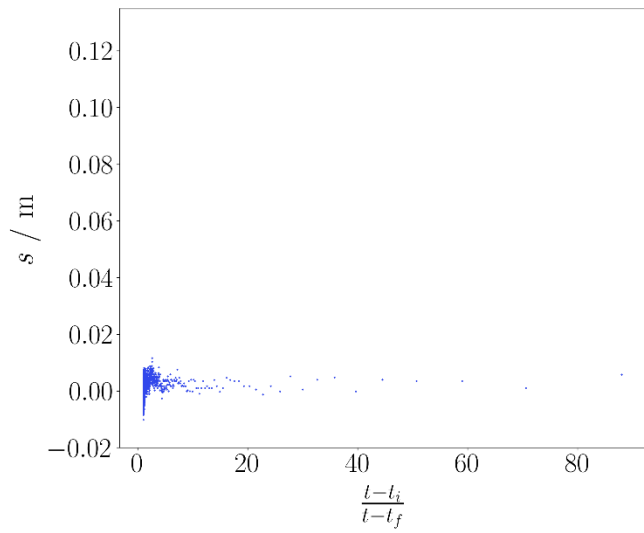
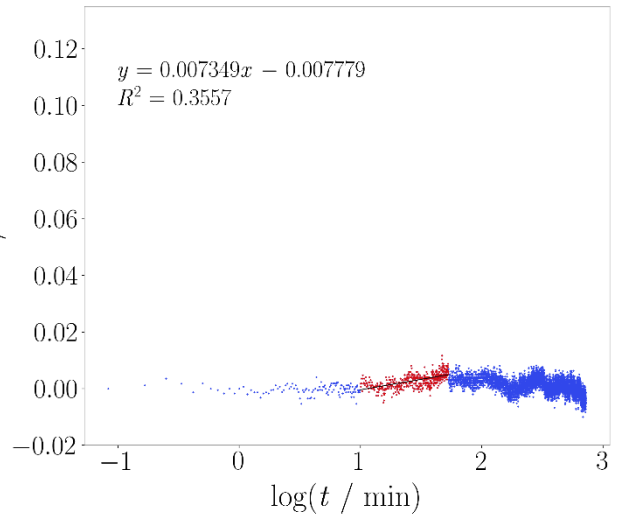
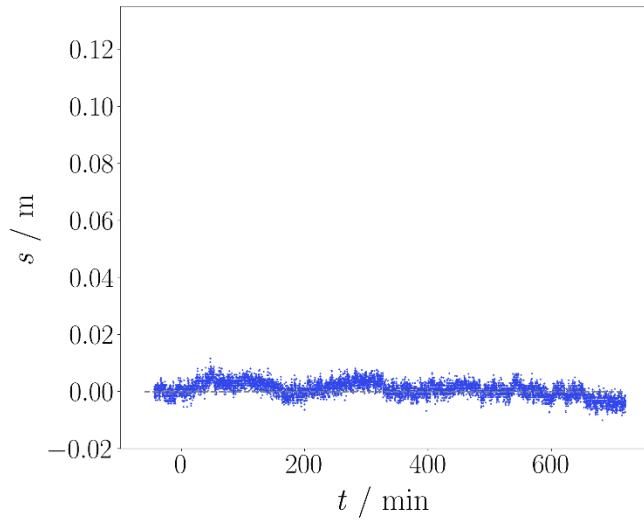


Figure A.20. Linear regression analysis of drawdown and recovery data for piezometre DCP2 for PT3.



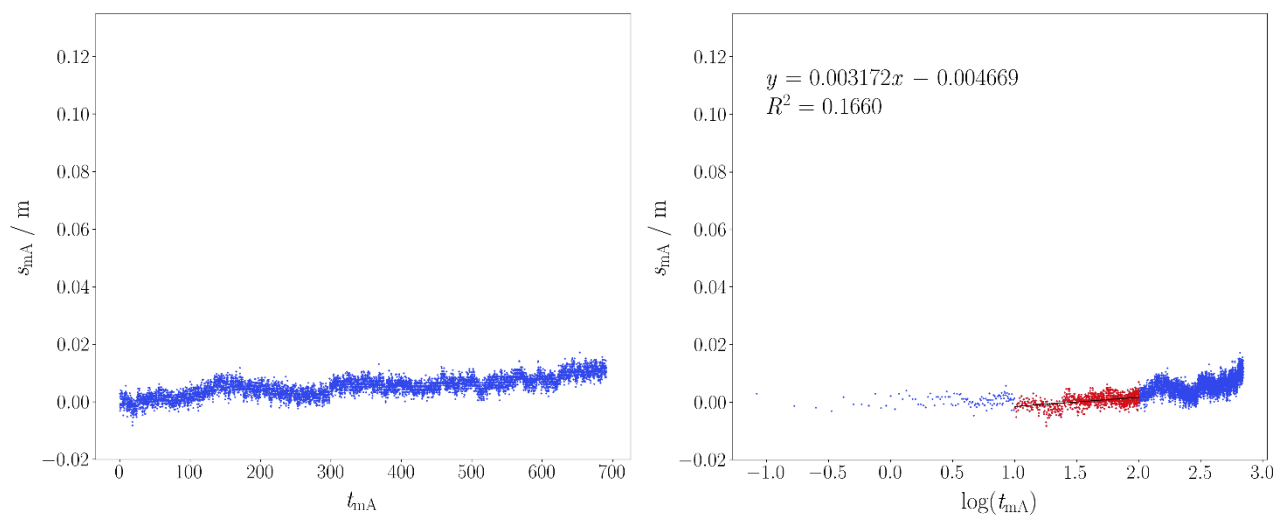


Figure A.21. Linear regression analysis of drawdown and recovery data for piezometre C1 for PT3.

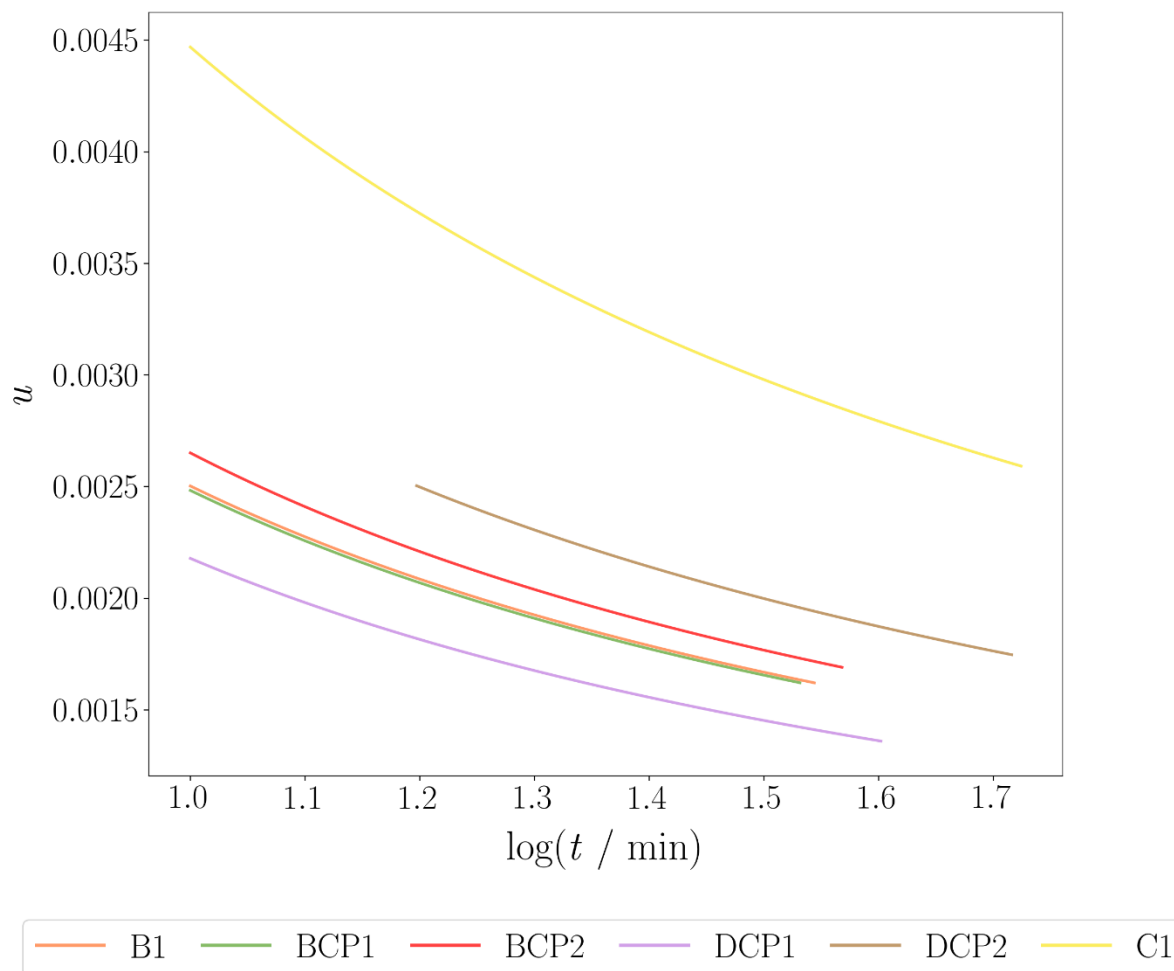
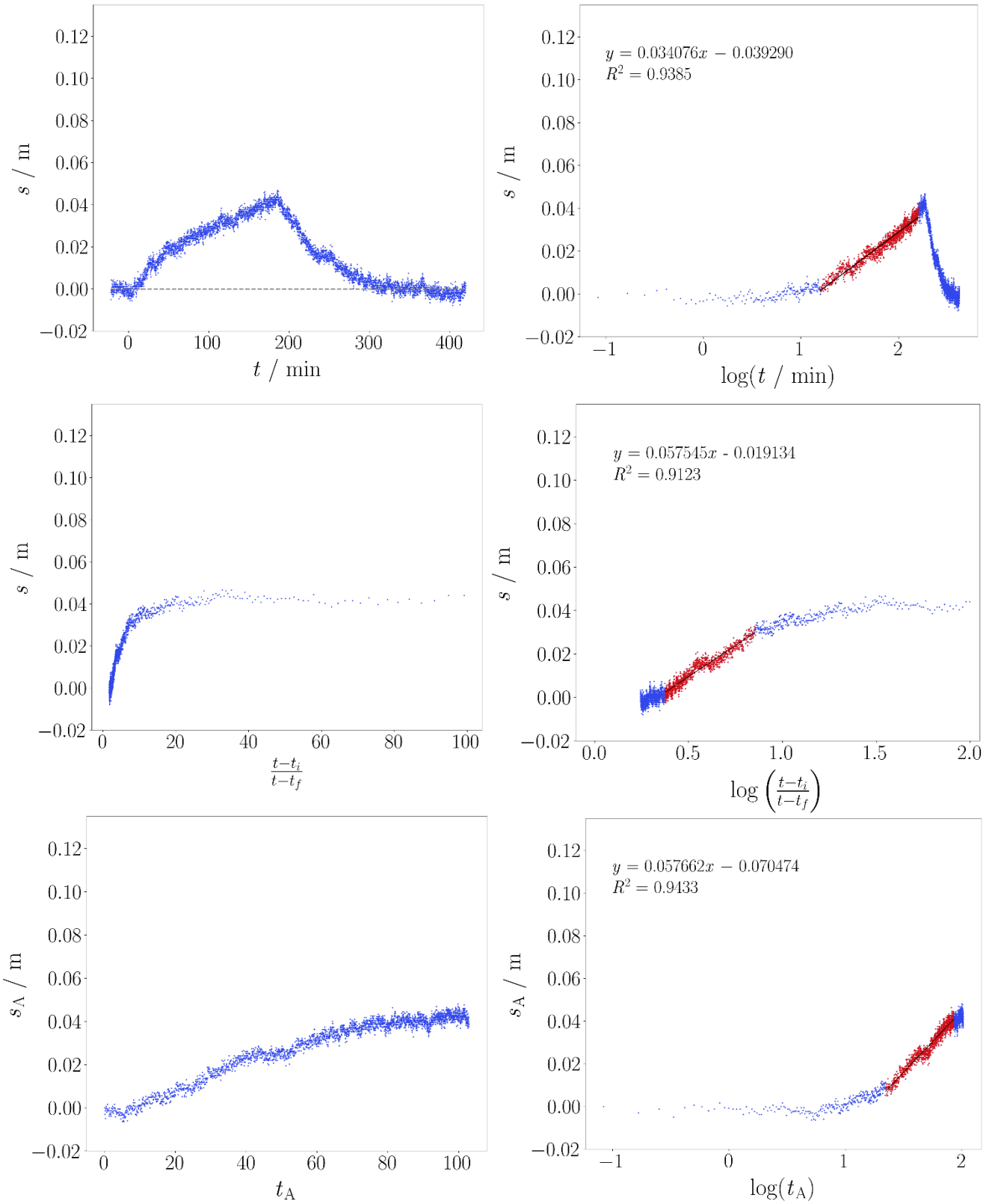


Figure A.22. Plot of u versus $\log(t)$ for the data used in the drawdown analysis of pumping test 3, to demonstrate the validity of the range of datapoints selected.



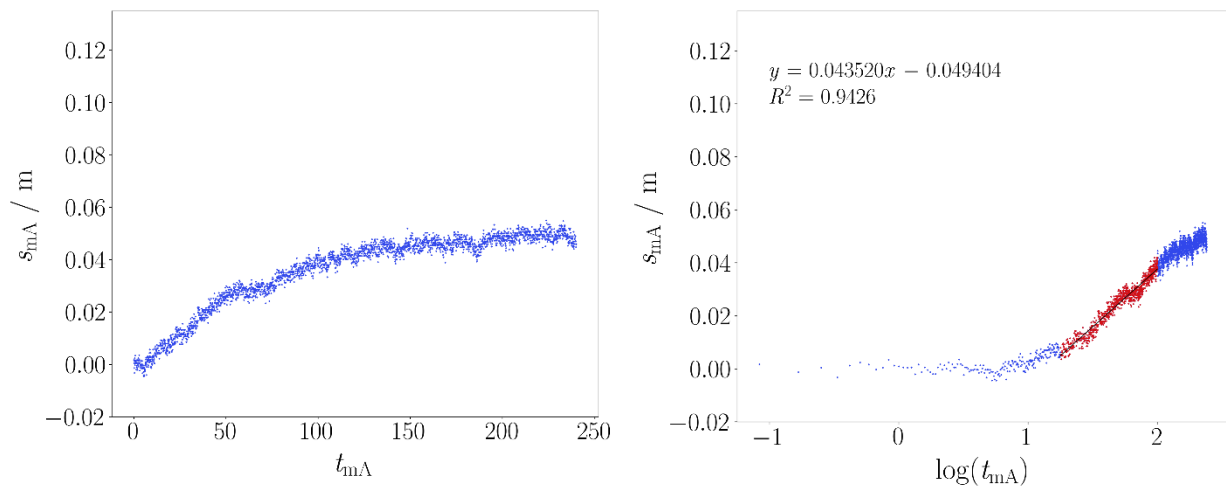
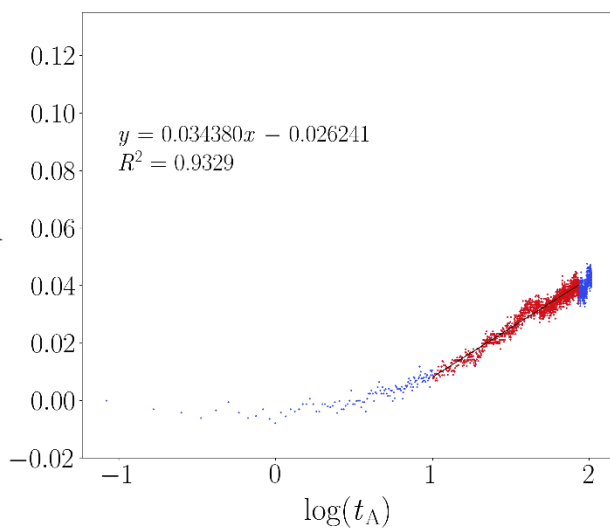
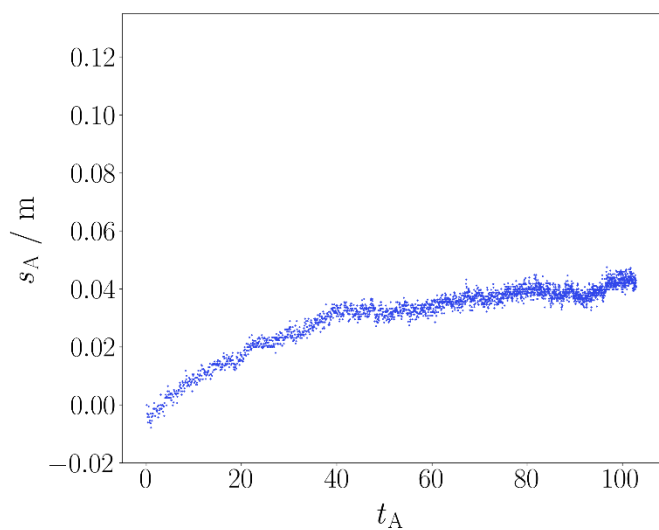
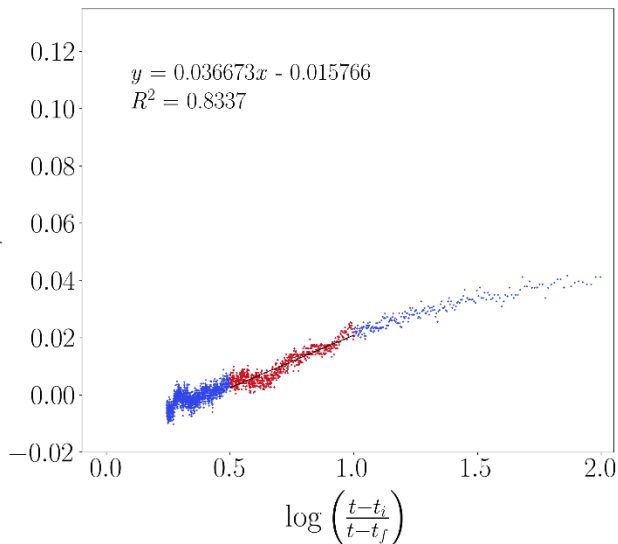
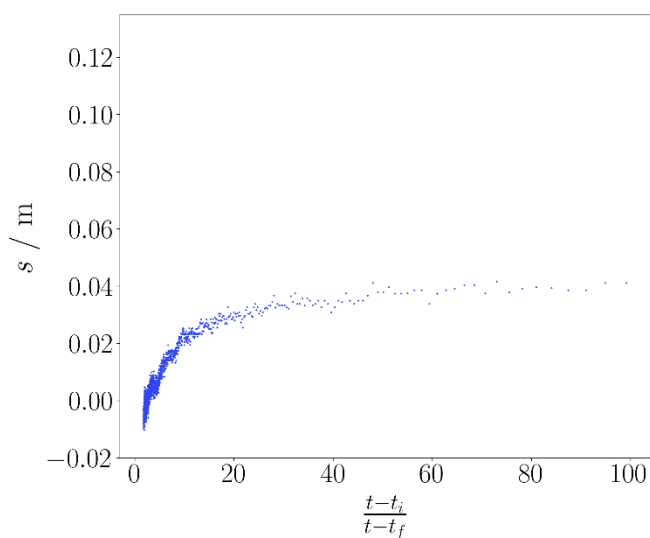
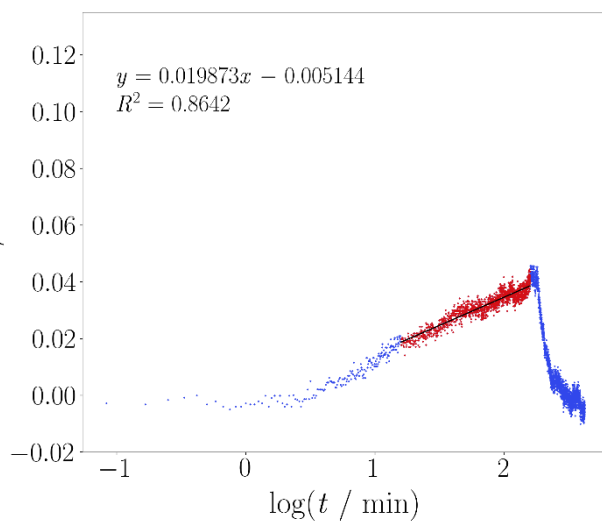
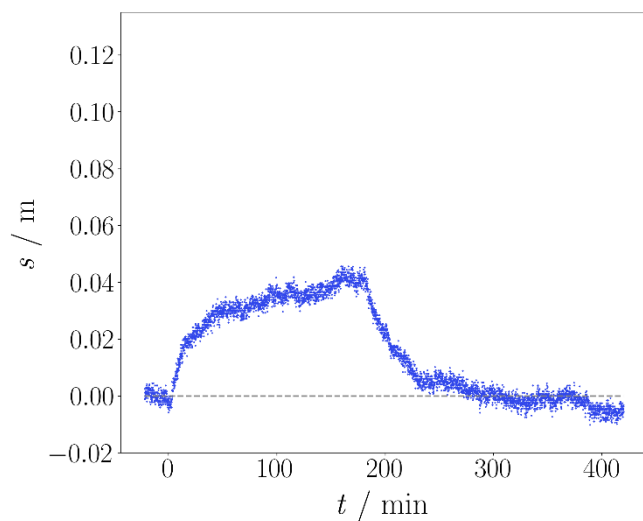


Figure A.23. Linear regression analysis of drawdown and recovery data for piezometre A3 for PT4.



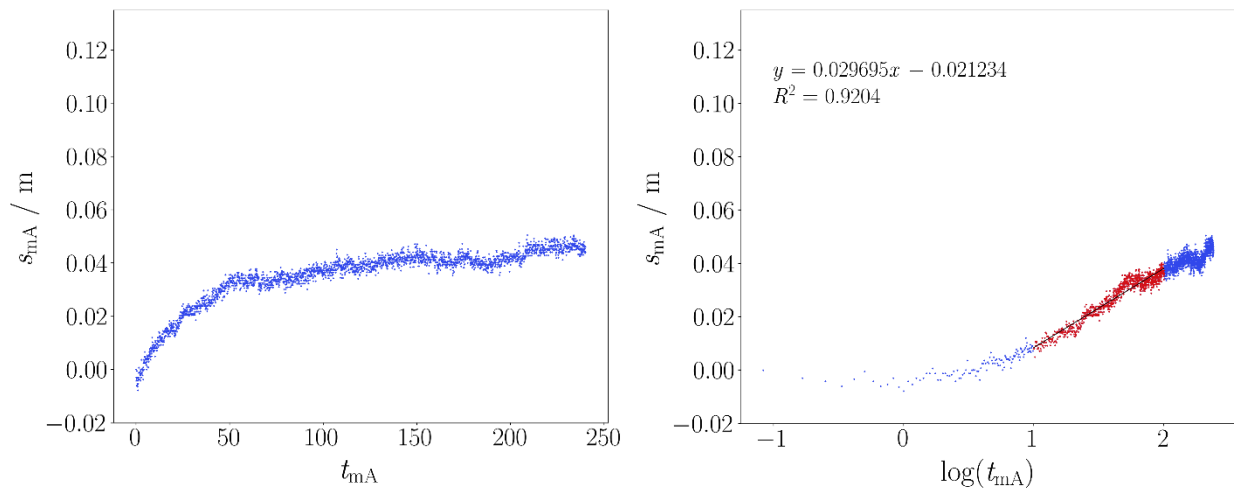
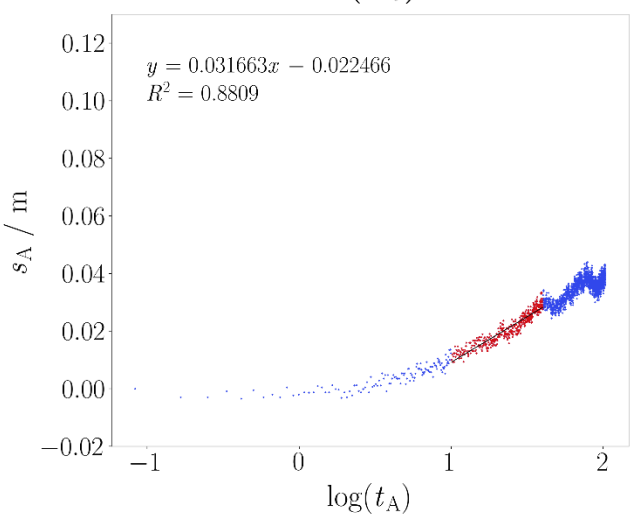
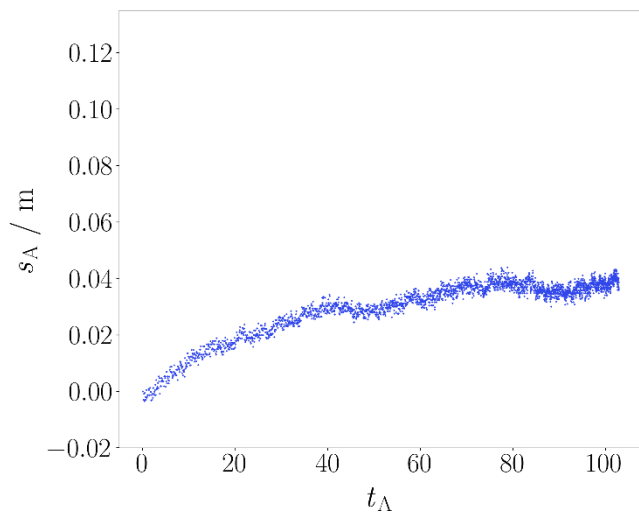
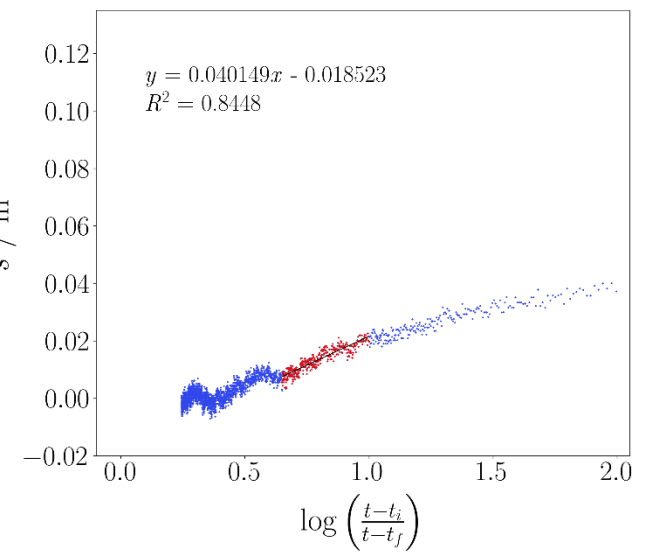
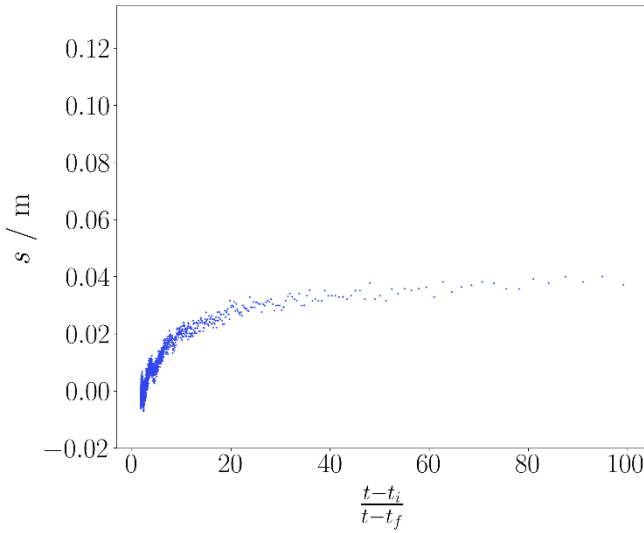
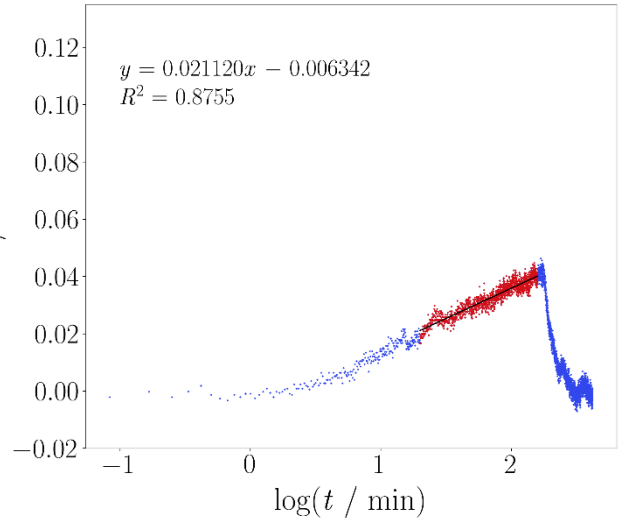
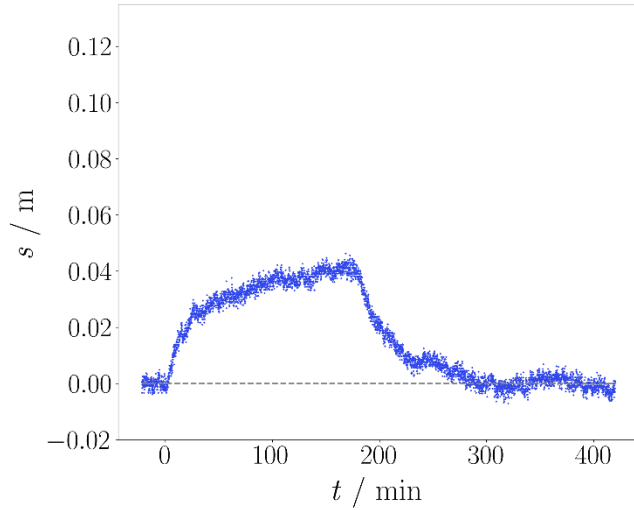


Figure A.24. Linear regression analysis of drawdown and recovery data for piezometre B1 for PT4.



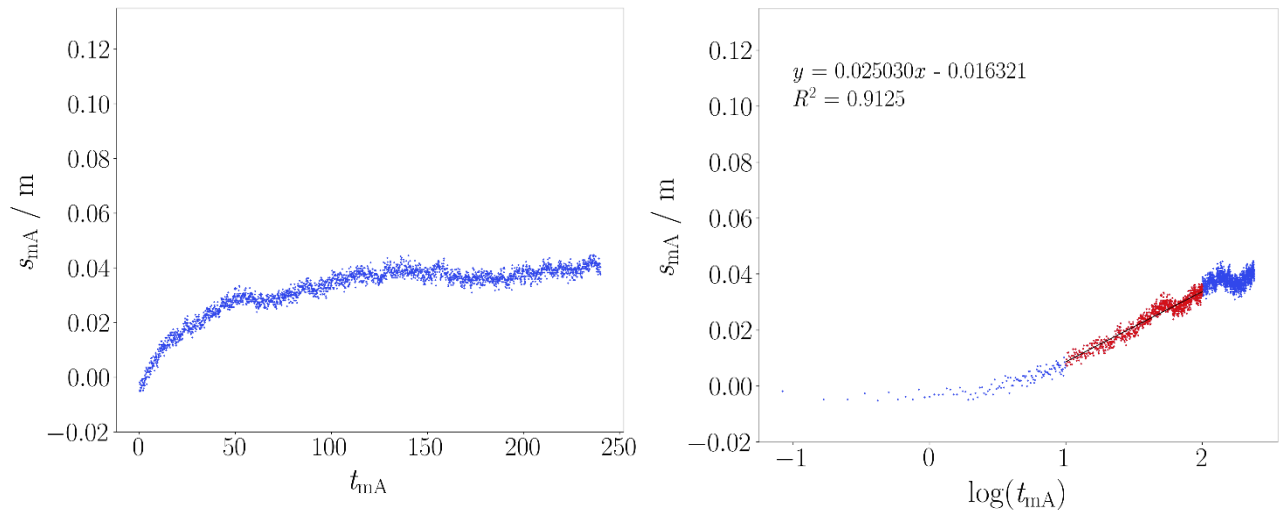
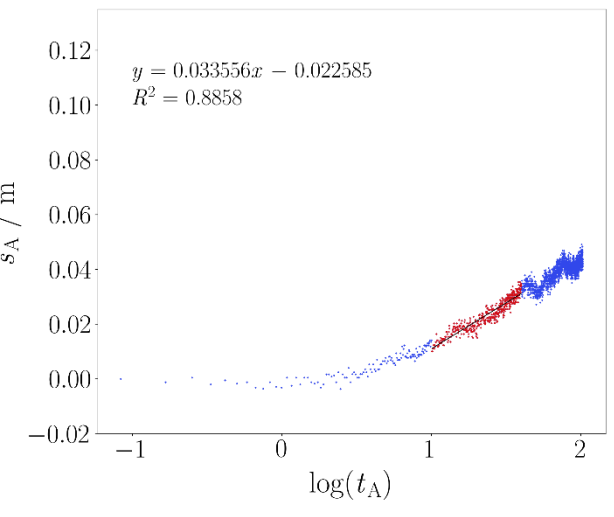
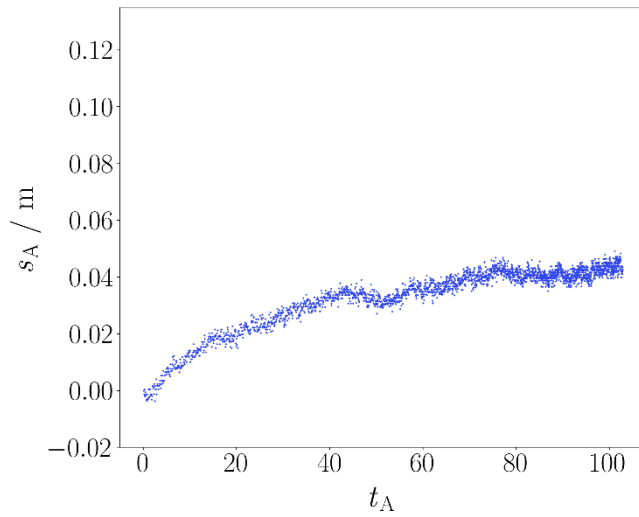
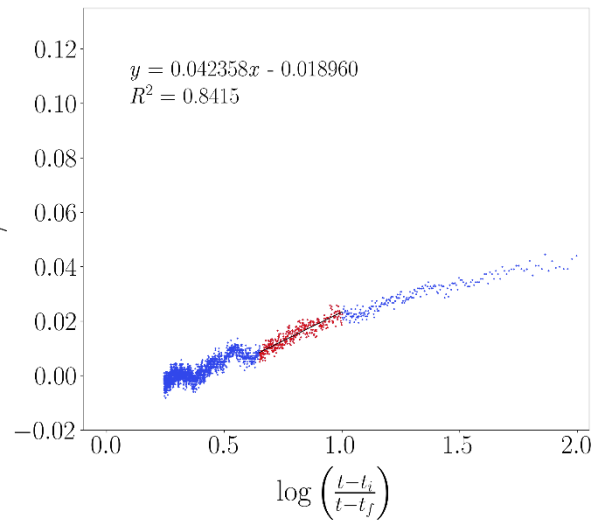
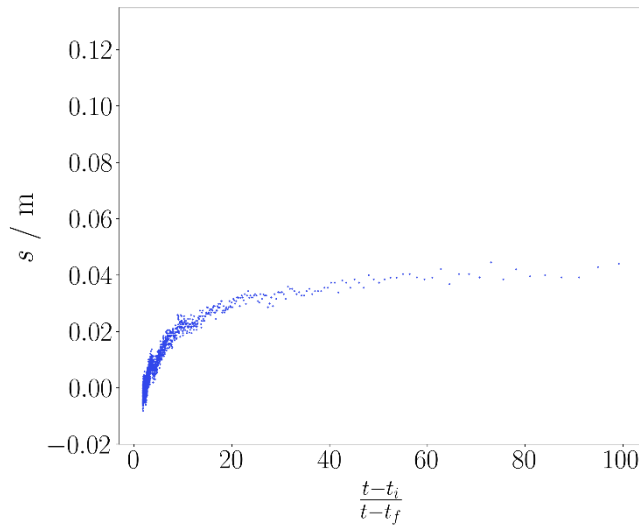
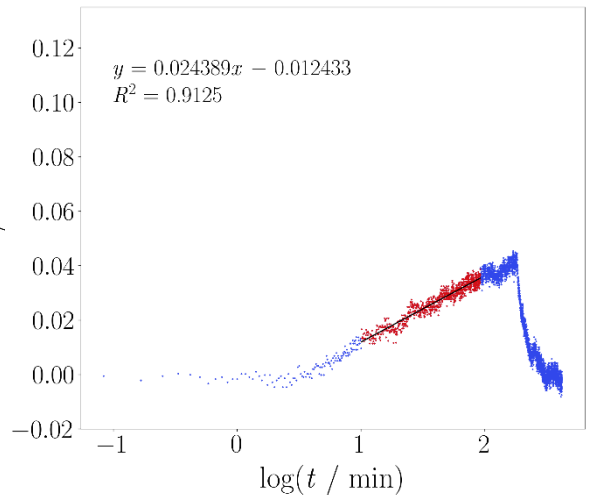
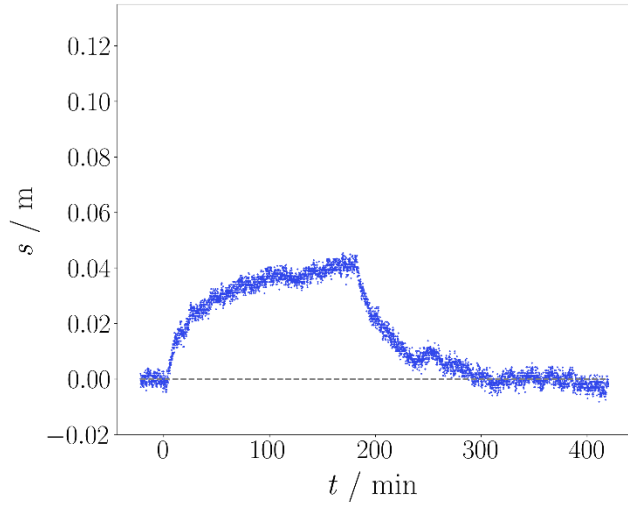


Figure A.25. Linear regression analysis of drawdown and recovery data for piezometre BCP1 for PT4.



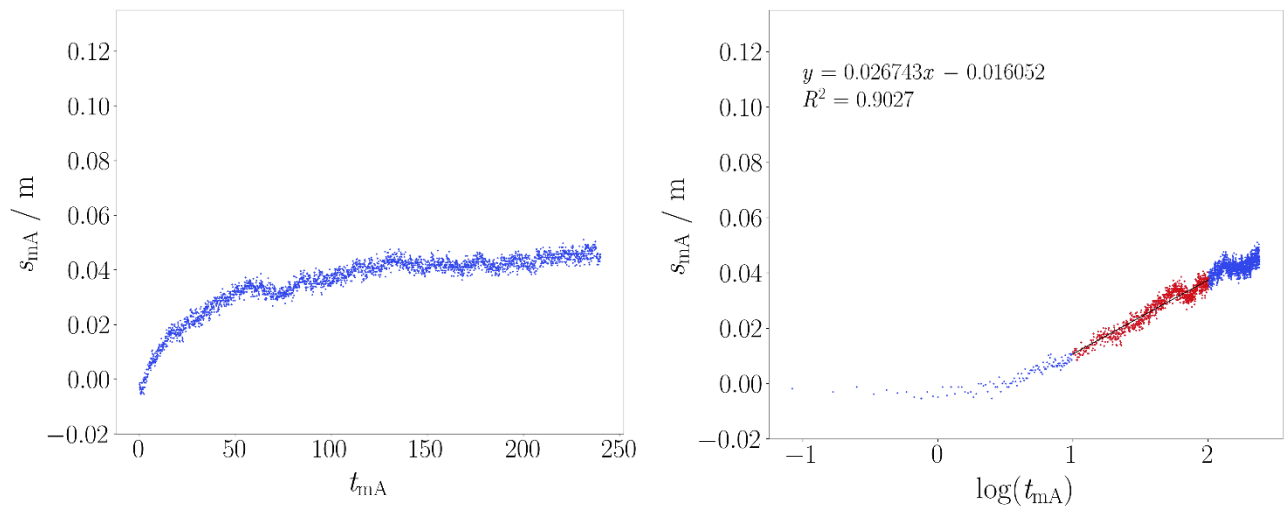
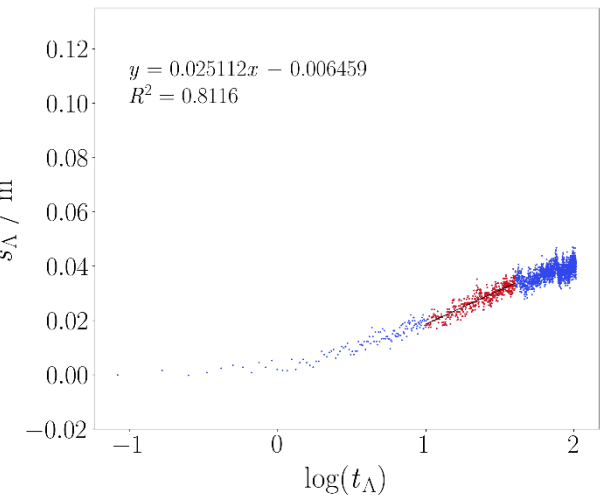
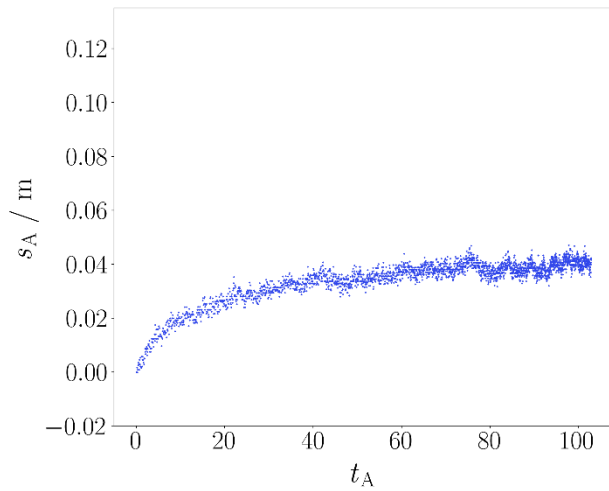
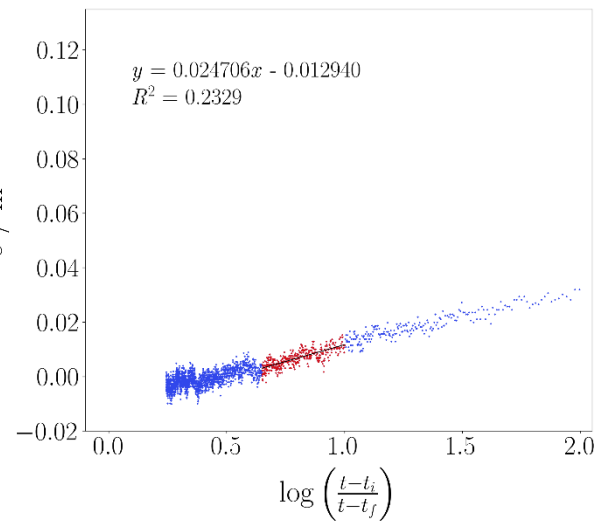
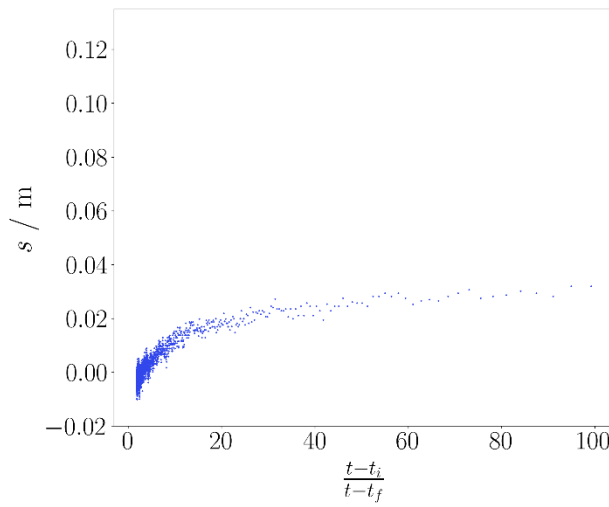
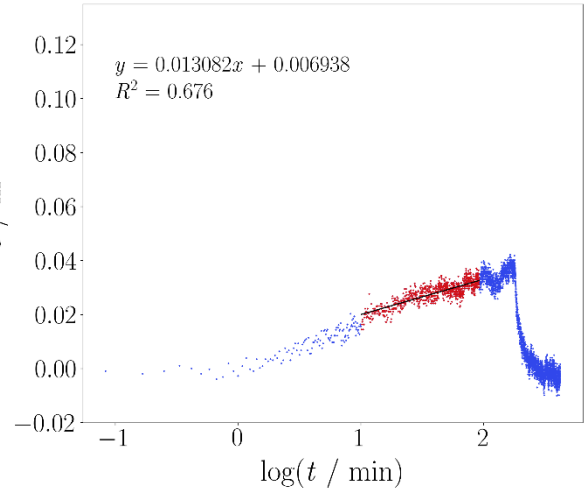
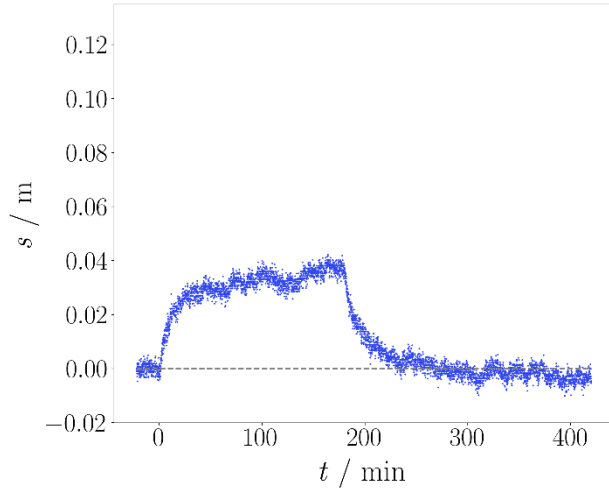


Figure A.26. Linear regression analysis of drawdown and recovery data for piezometre BCP2 for PT4.



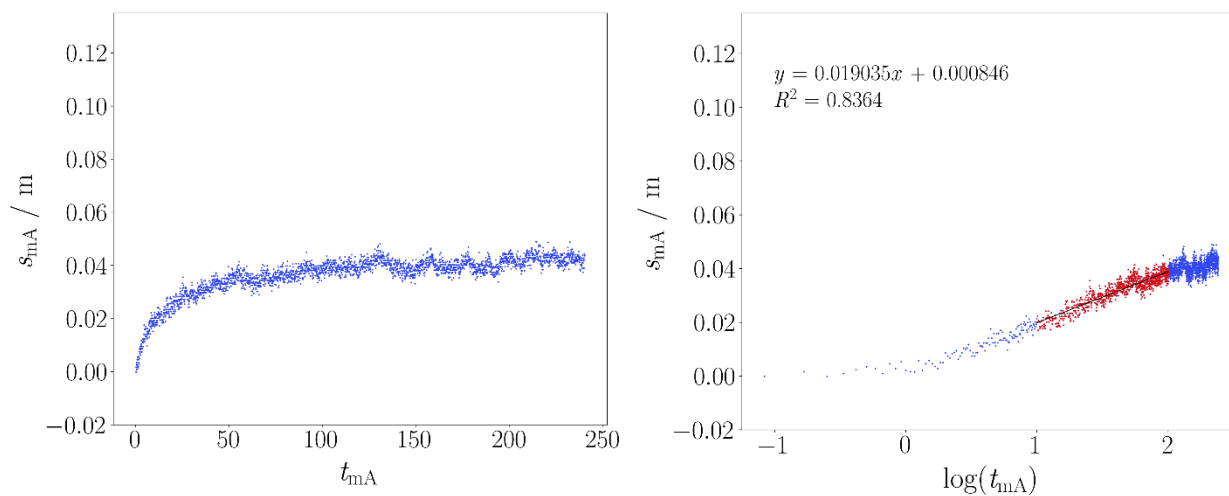
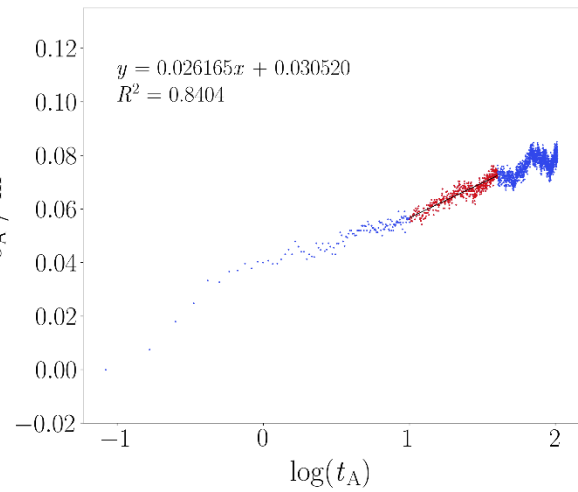
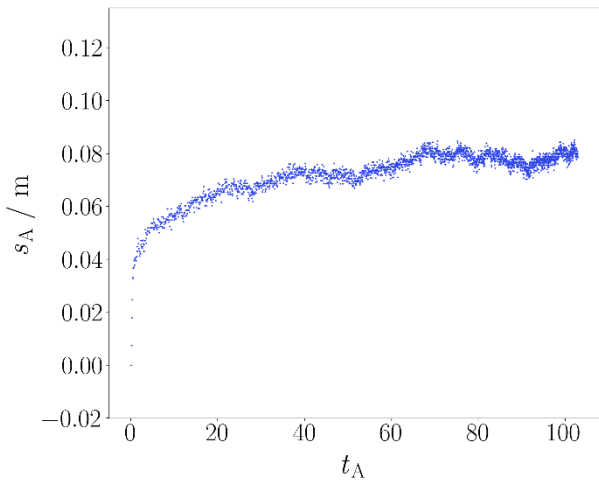
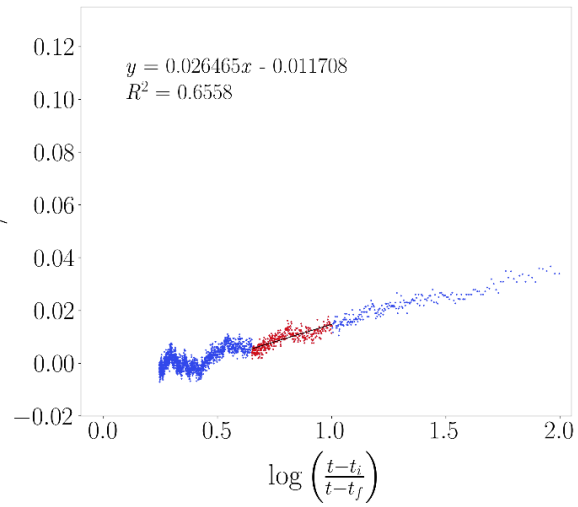
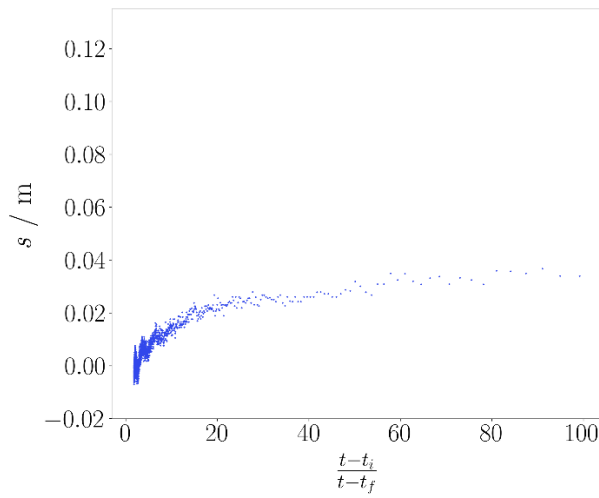
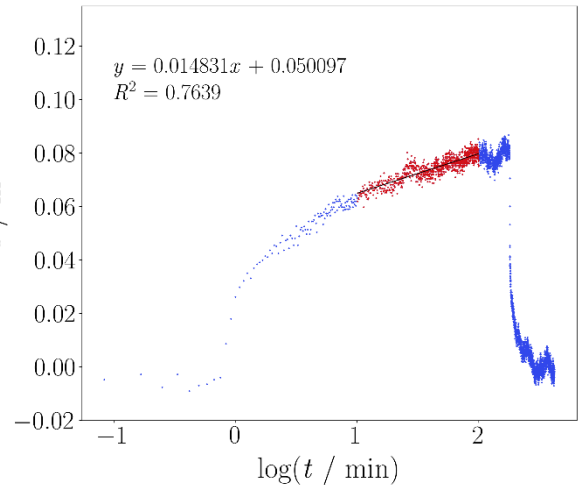
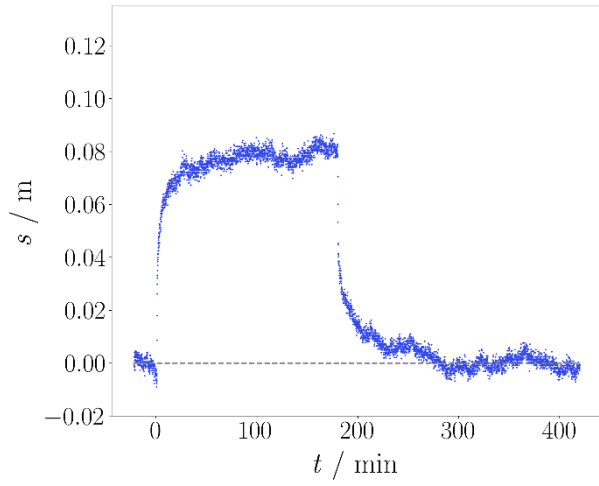


Figure A.27. Linear regression analysis of drawdown and recovery data for piezometre DCP1 for PT4.



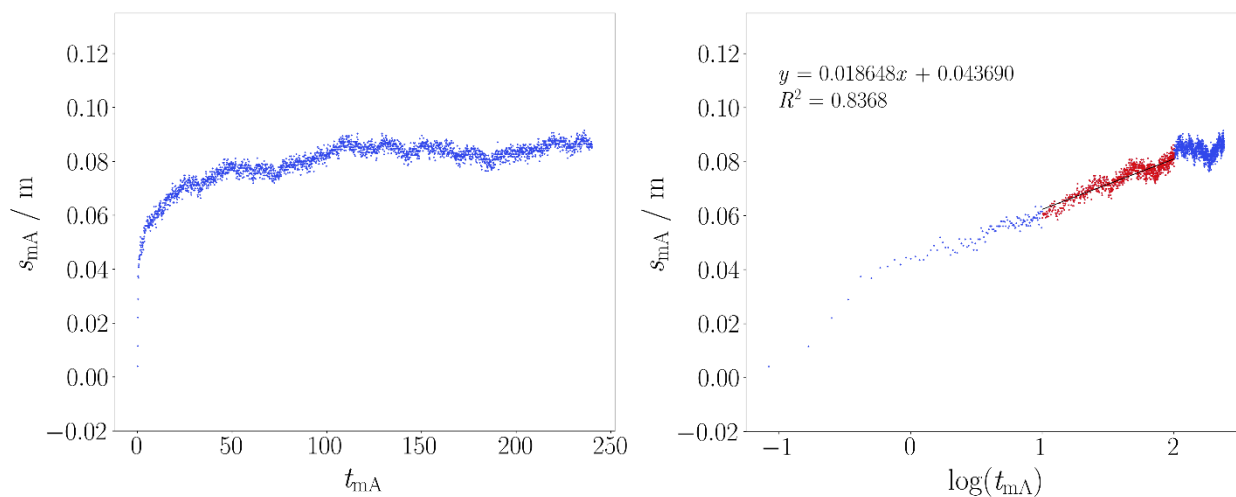
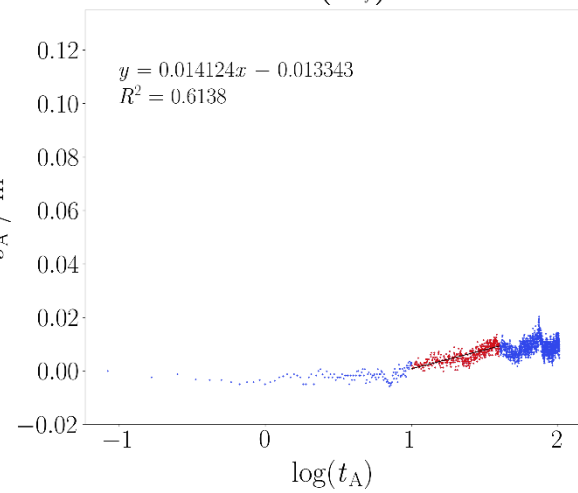
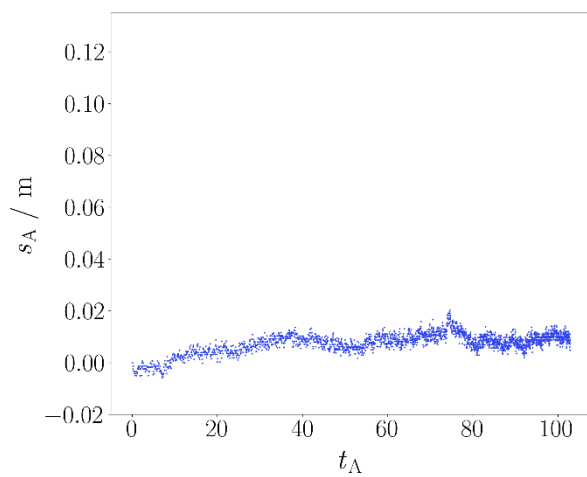
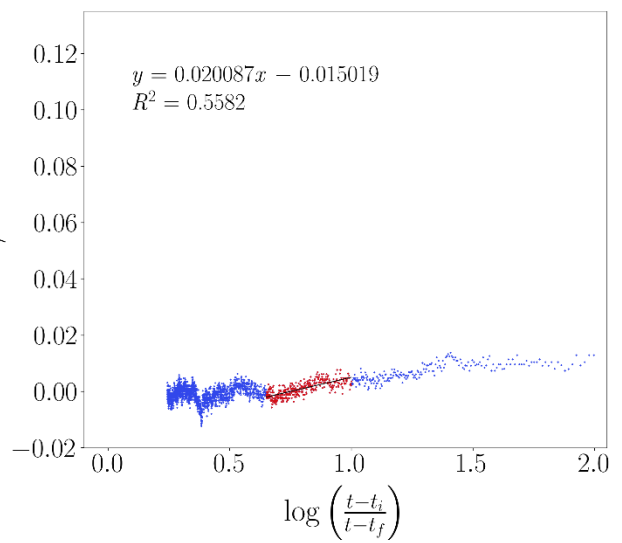
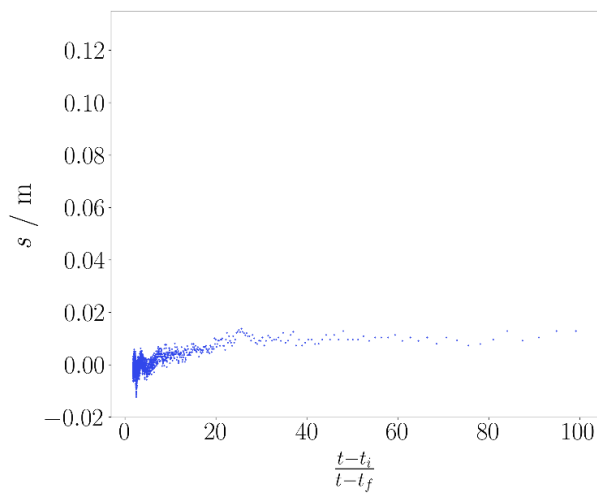
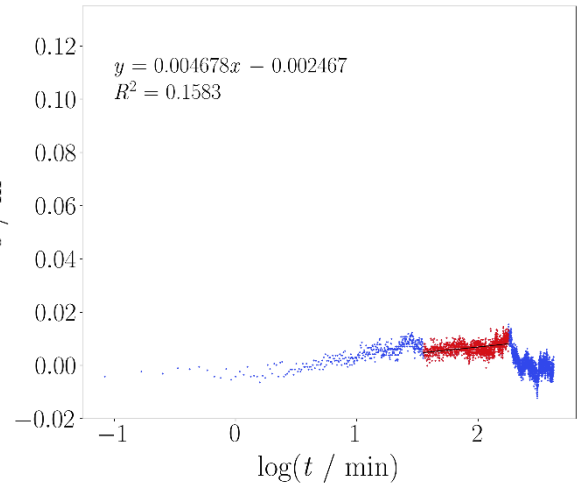
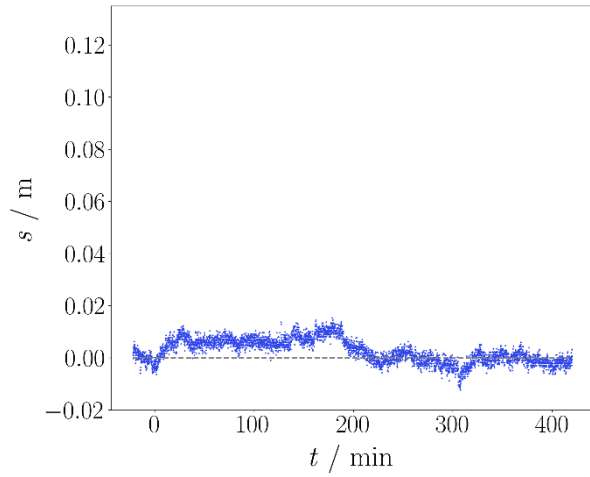


Figure A.28. Linear regression analysis of drawdown and recovery data for piezometre DCP2 for PT4.



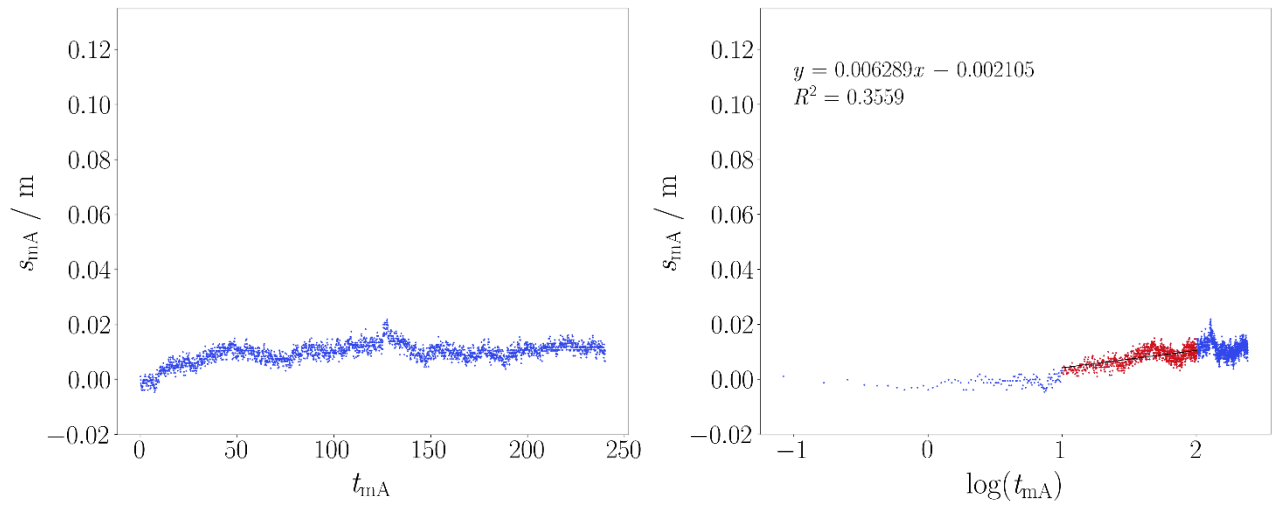


Figure A.29. Linear regression analysis of drawdown and recovery data for piezometre C1 for PT4.

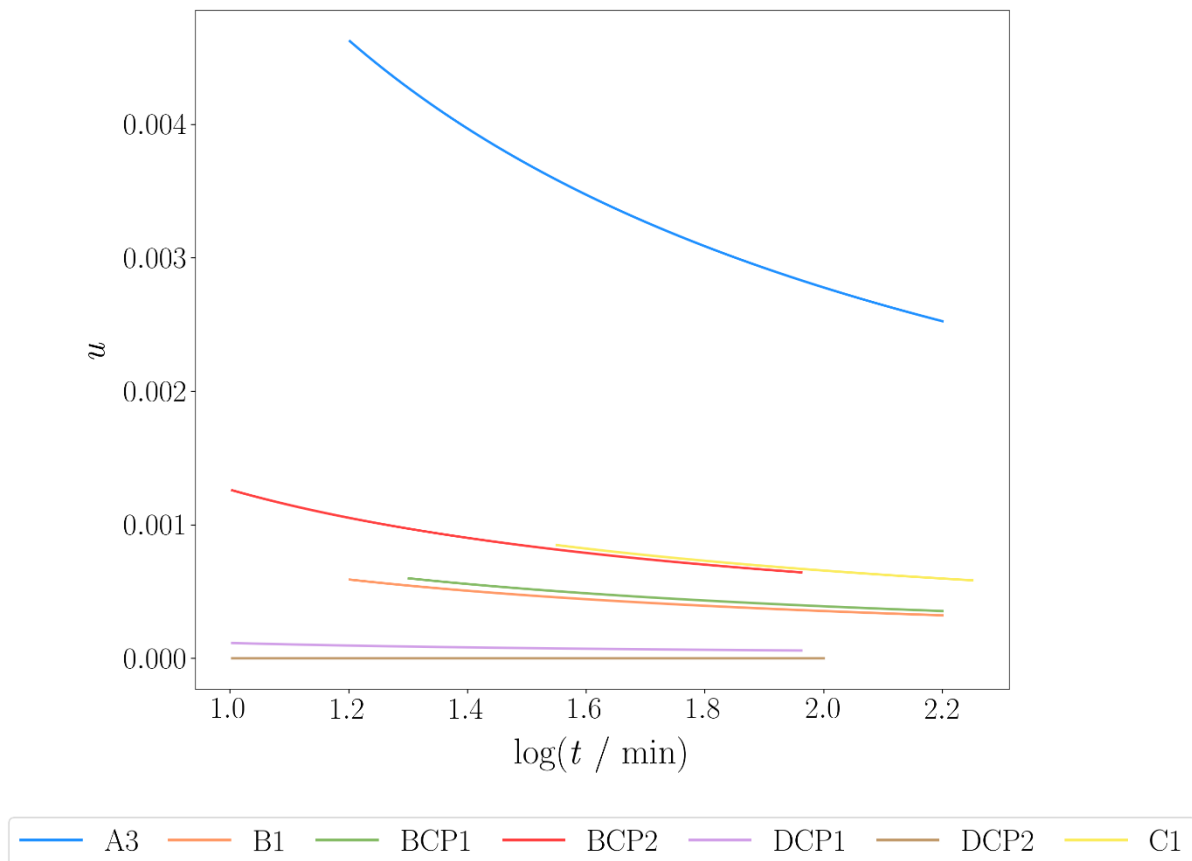


Figure A.30. Plot of u versus $\log(t)$ for the data used in the drawdown analysis of pumping test 4, to demonstrate the validity of the range of datapoints selected.