

APPENDIX F

F. RESULTS FROM 3D SOIL MOISTURE PROFILE ESTIMATION

F.1 CALIBRATION OF ABDOMEN3D

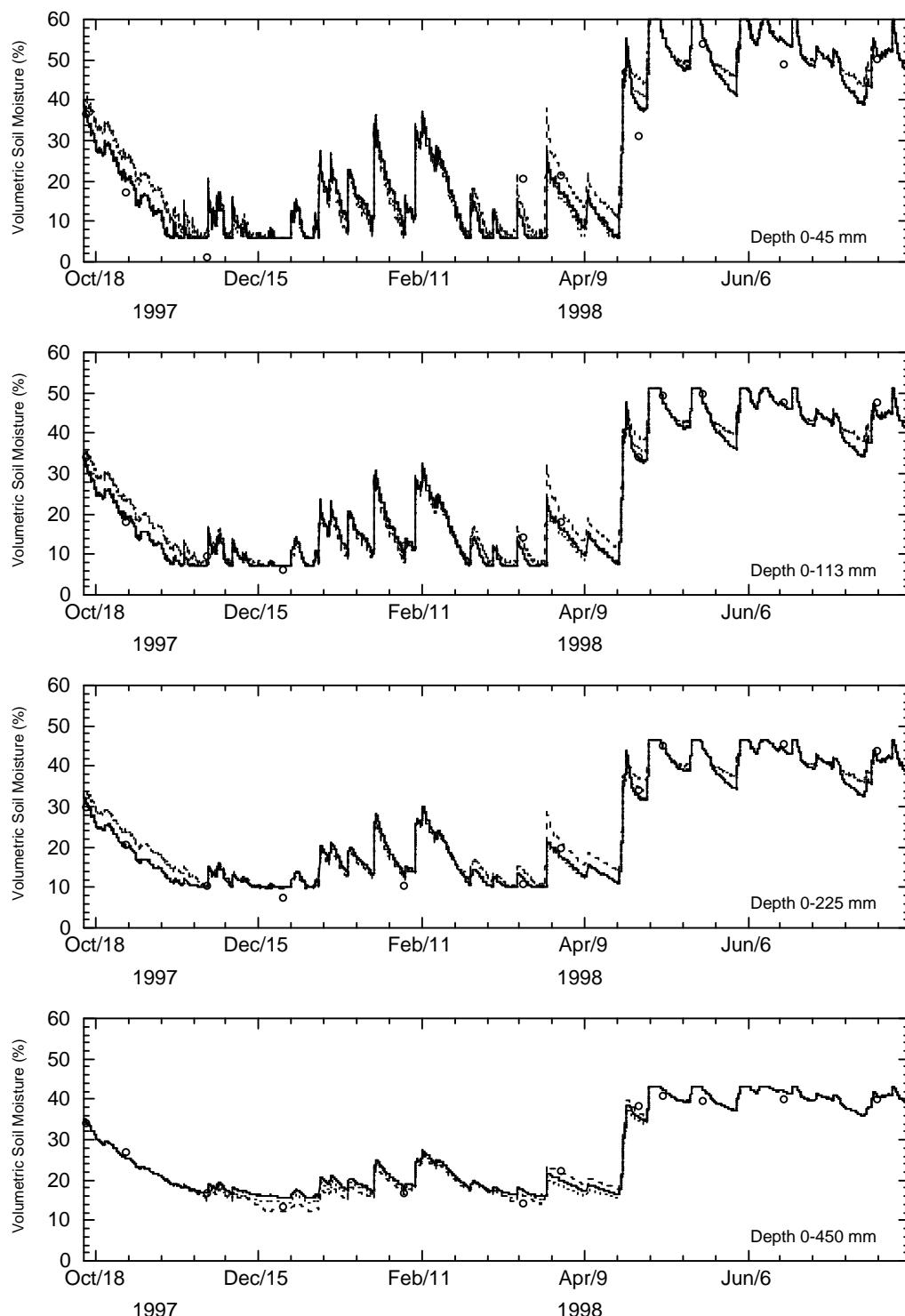


Figure F.1: Calibration results from soil moisture profile number 1. Connector TDR observations (open circles) are compared against one-dimensional simulation results with calibrated parameters (solid line) and averaged parameters (short dashed line), and three-dimensional simulation results with averaged parameters (long dashed line).

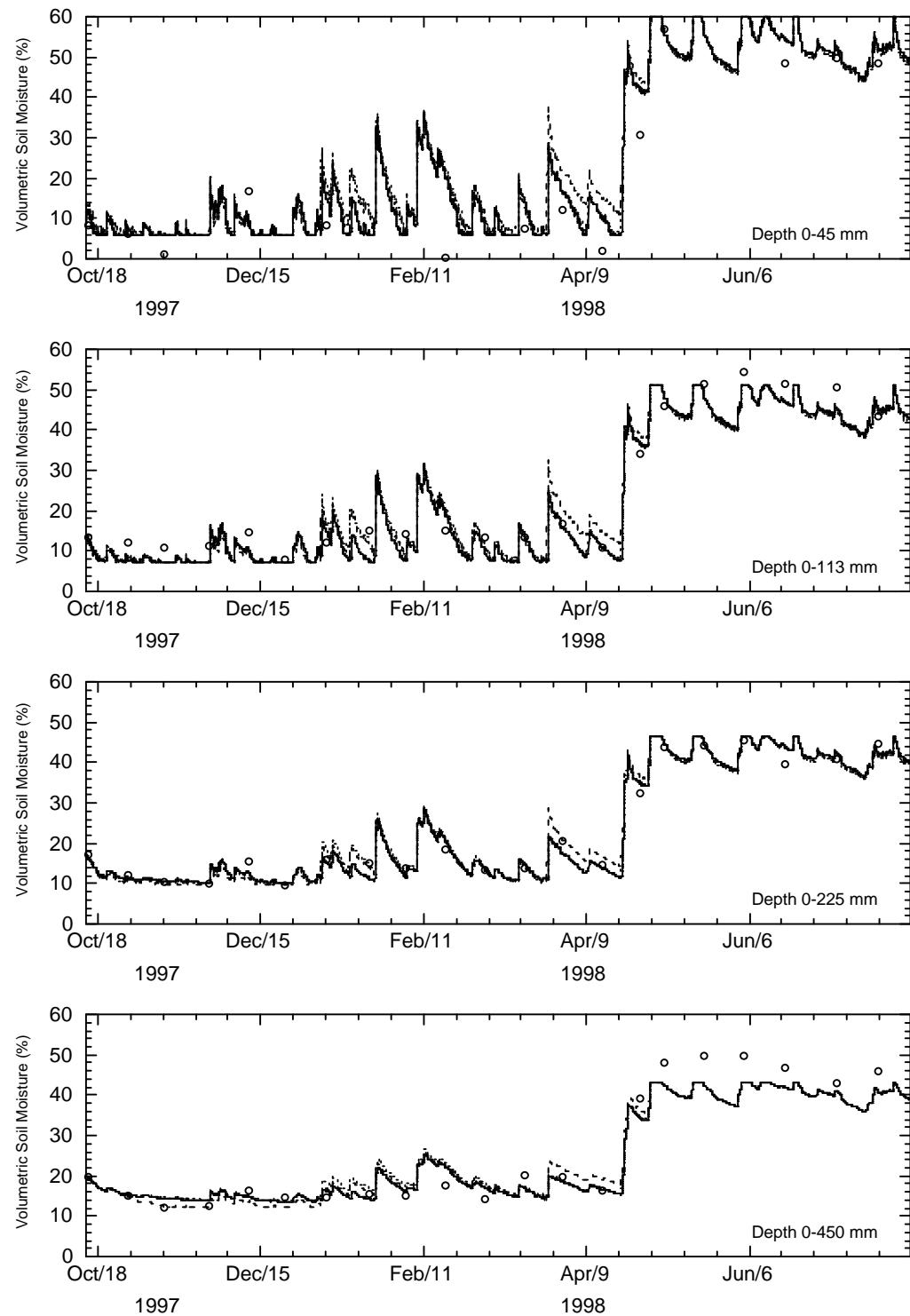


Figure F.2: Calibration results from soil moisture profile number 2. Connector TDR observations (open circles) are compared against one-dimensional simulation results with calibrated parameters (solid line) and averaged parameters (short dashed line), and three-dimensional simulation results with averaged parameters (long dashed line).

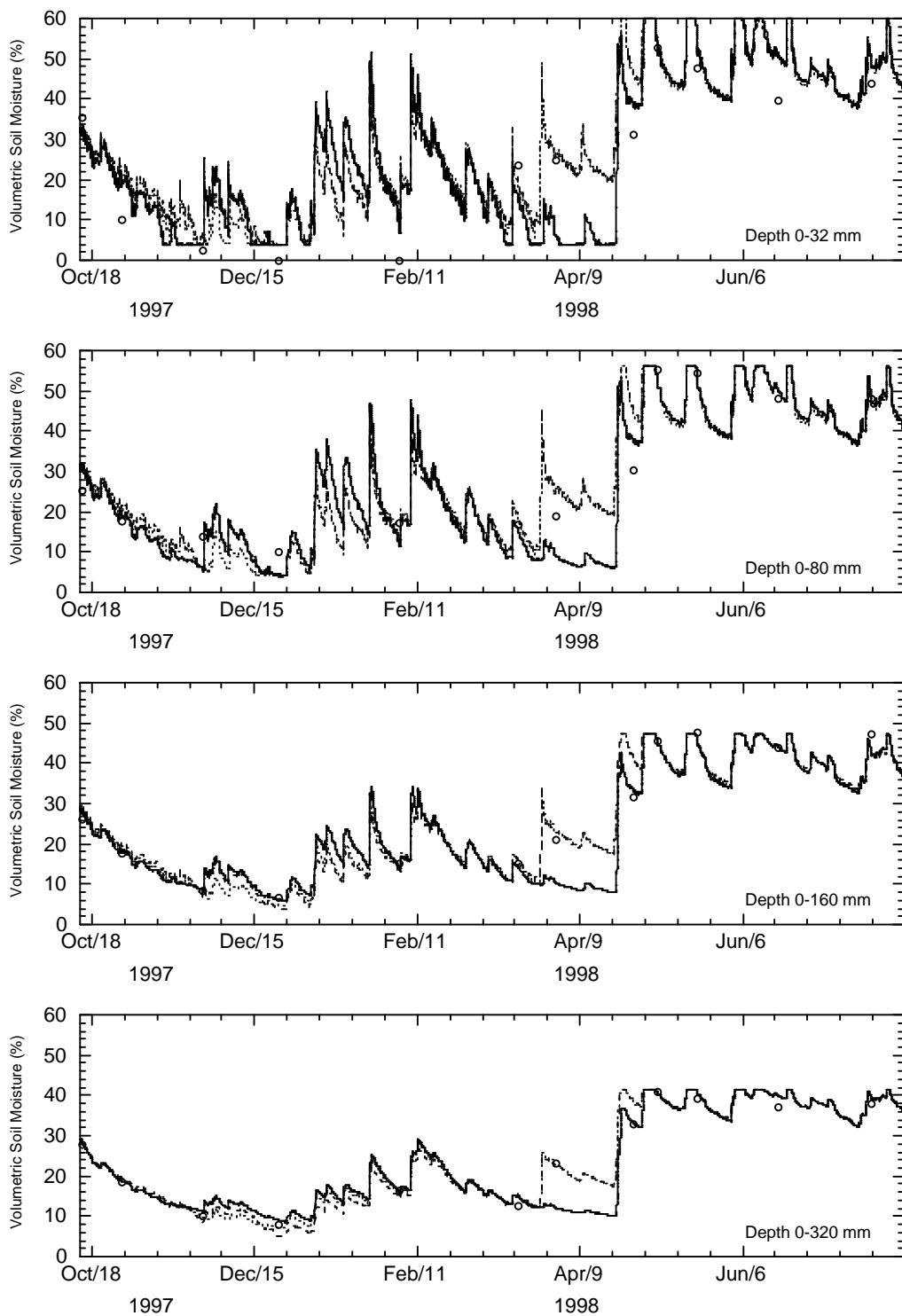


Figure F.3: Calibration results from soil moisture profile number 3. Connector TDR observations (open circles) are compared against one-dimensional simulation results with calibrated parameters (solid line) and averaged parameters (short dashed line), and three-dimensional simulation results with averaged parameters (long dashed line).

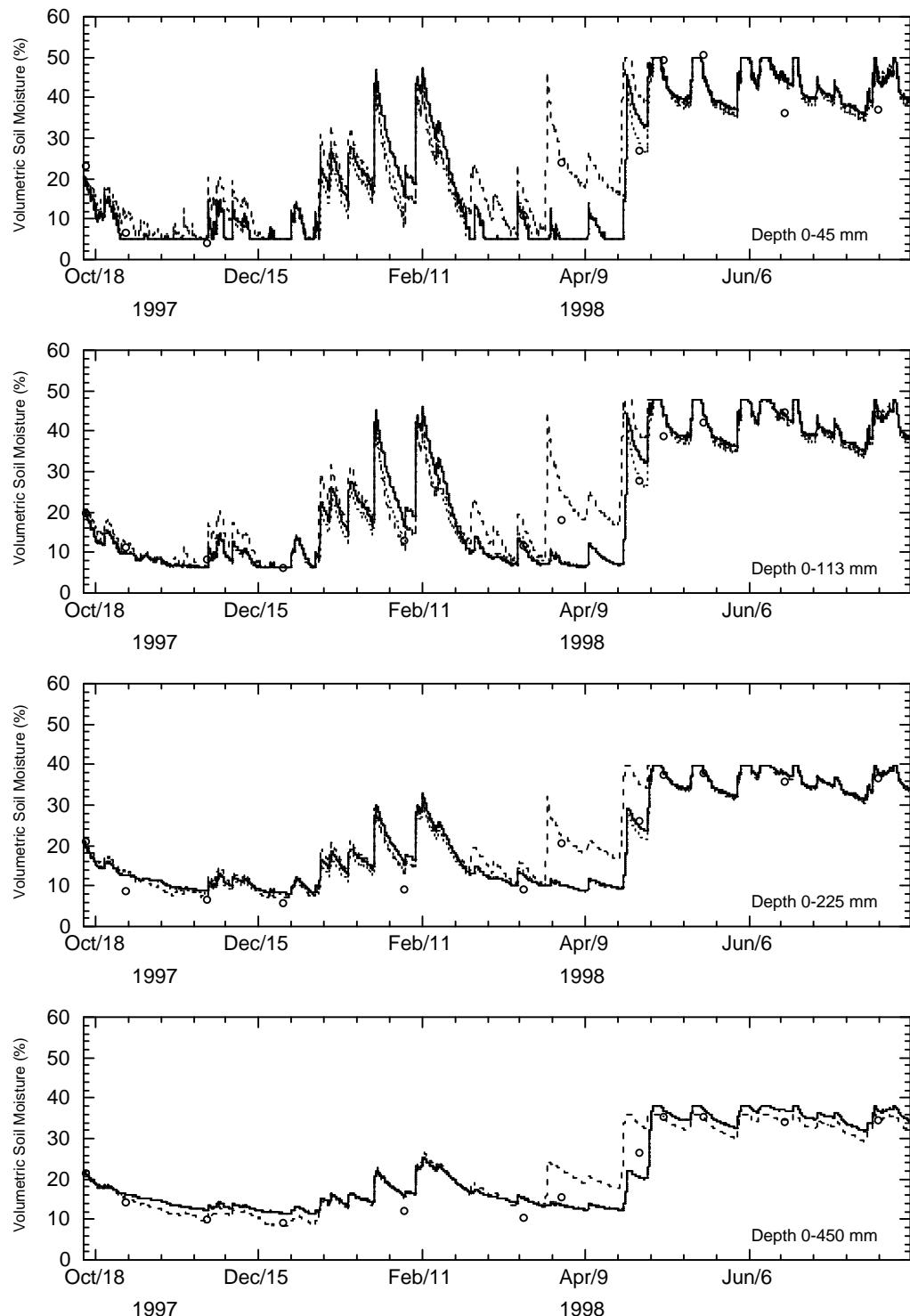


Figure F.4: Calibration results from soil moisture profile number 4. Connector TDR observations (open circles) are compared against one-dimensional simulation results with calibrated parameters (solid line) and averaged parameters (short dashed line), and three-dimensional simulation results with averaged parameters (long dashed line).

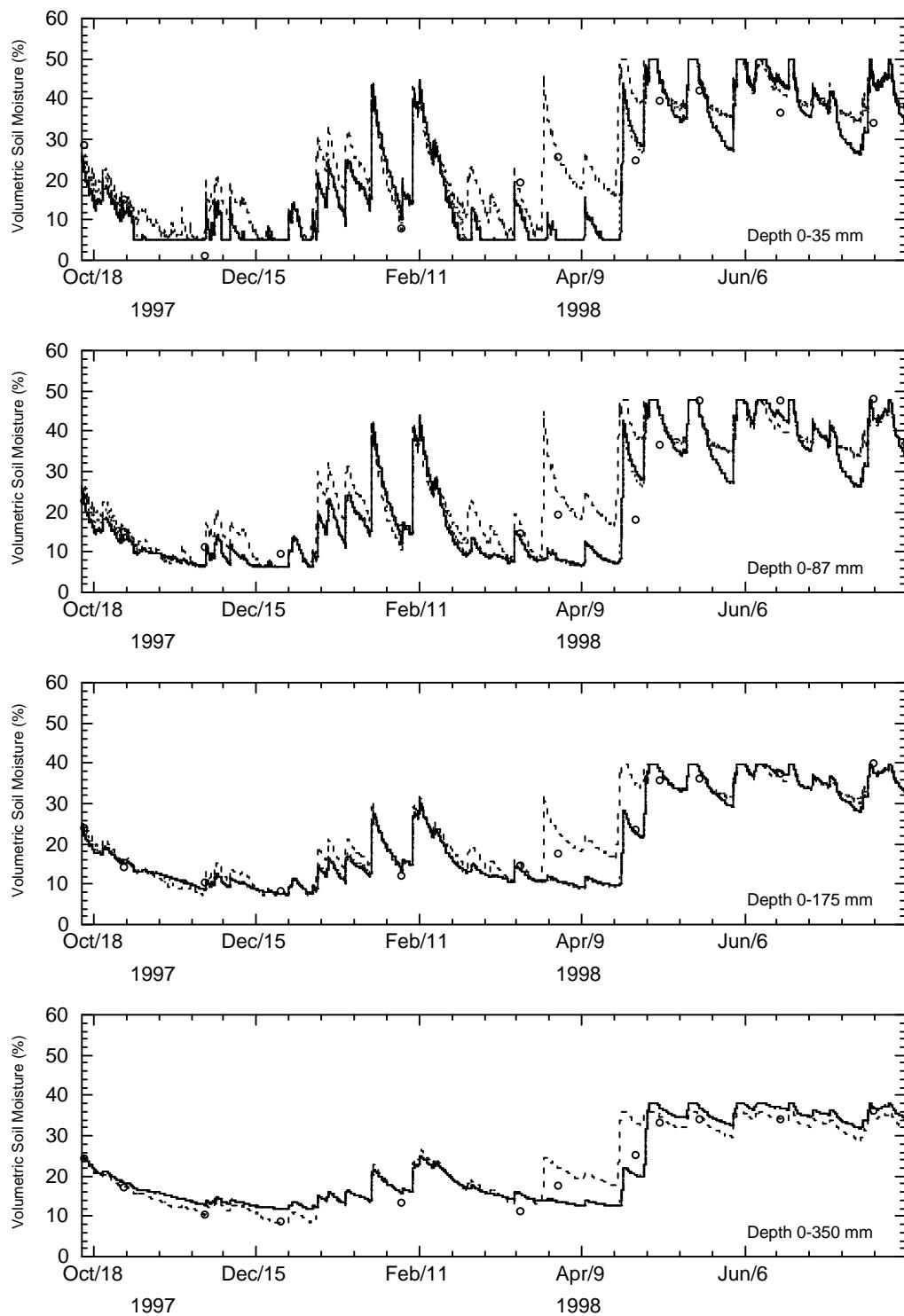


Figure F.5: Calibration results from soil moisture profile number 5. Connector TDR observations (open circles) are compared against one-dimensional simulation results with calibrated parameters (solid line) and averaged parameters (short dashed line), and three-dimensional simulation results with averaged parameters (long dashed line).

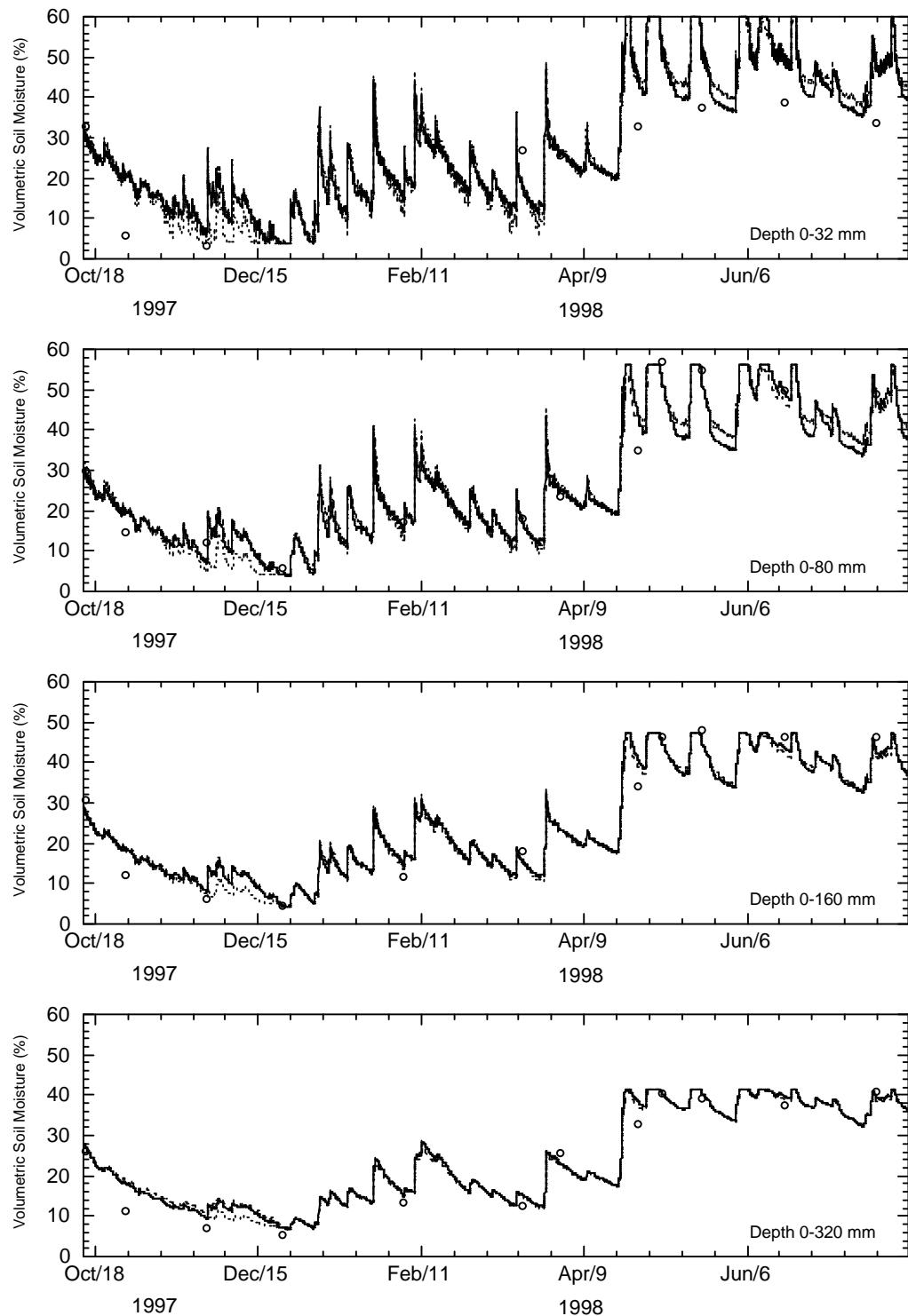


Figure F.6: Calibration results from soil moisture profile number 6. Connector TDR observations (open circles) are compared against one-dimensional simulation results with calibrated parameters (solid line) and averaged parameters (short dashed line), and three-dimensional simulation results with averaged parameters (long dashed line).

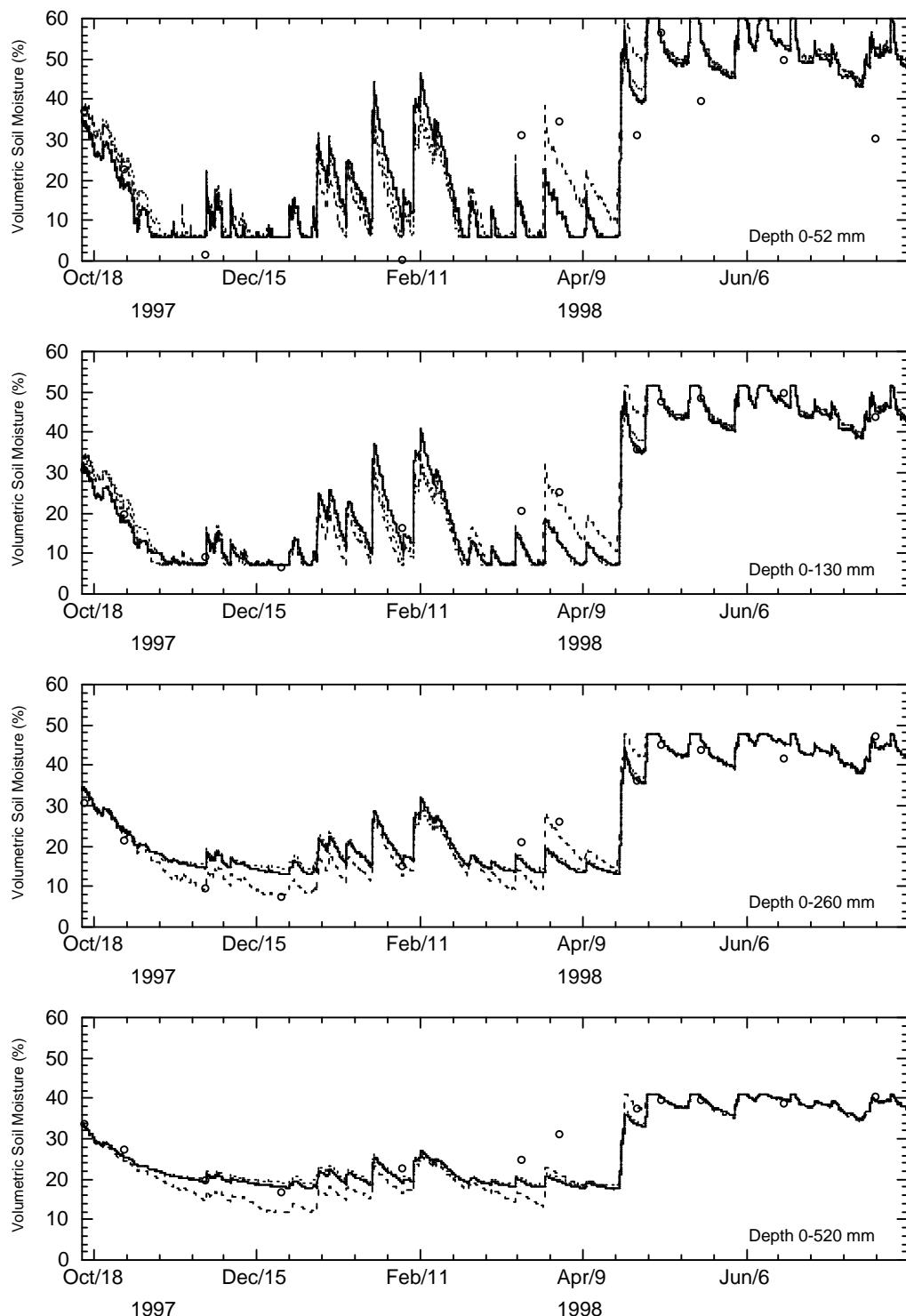


Figure F.7: Calibration results from soil moisture profile number 7. Connector TDR observations (open circles) are compared against one-dimensional simulation results with calibrated parameters (solid line) and averaged parameters (short dashed line), and three-dimensional simulation results with averaged parameters (long dashed line).

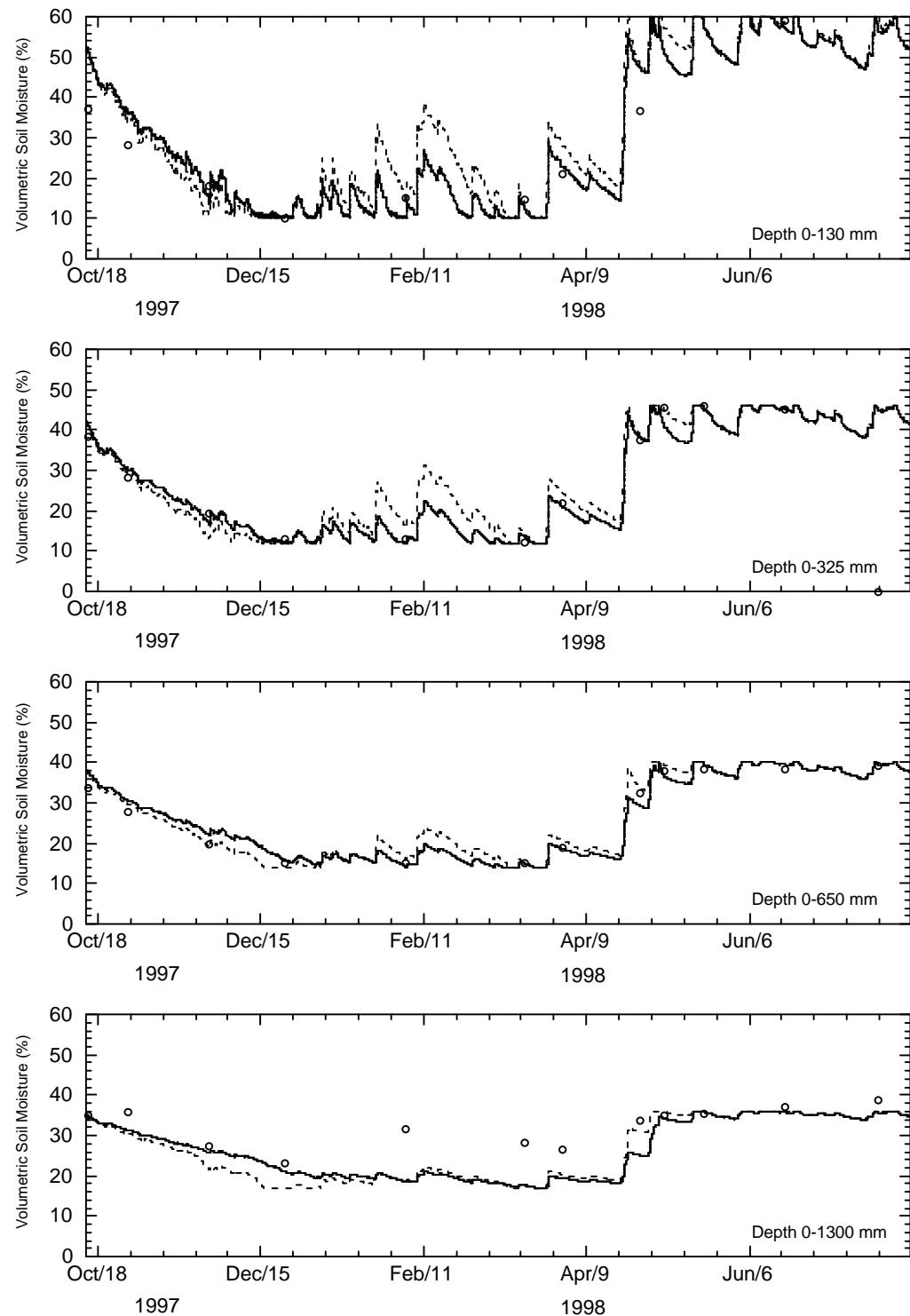


Figure F.8: Calibration results from soil moisture profile number 8. Connector TDR observations (open circles) are compared against one-dimensional simulation results with calibrated parameters (solid line) and averaged parameters (short dashed line), and three-dimensional simulation results with averaged parameters (long dashed line).

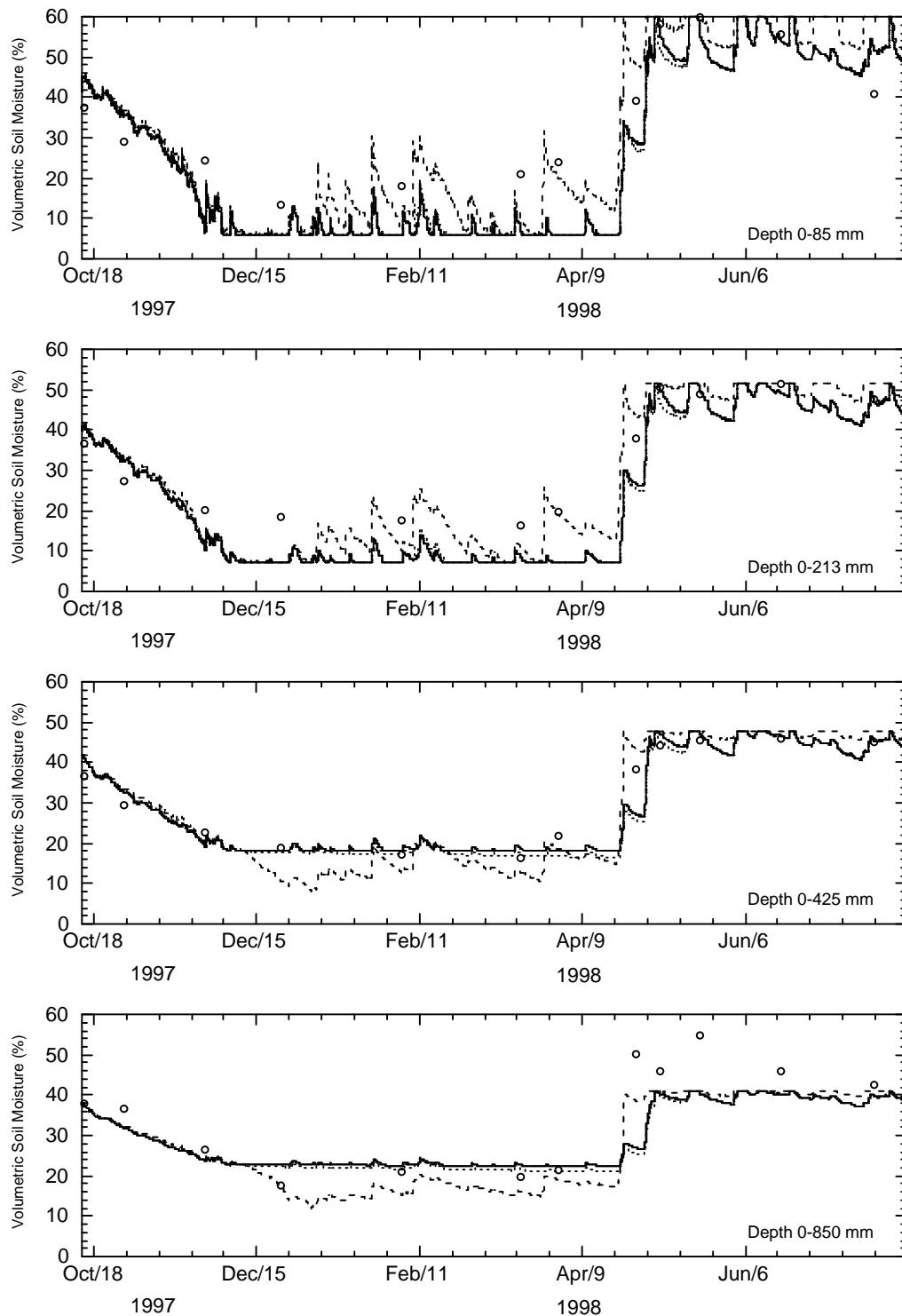


Figure F.9: Calibration results from soil moisture profile number 9. Connector TDR observations (open circles) are compared against one-dimensional simulation results with calibrated parameters (solid line) and averaged parameters (short dashed line), and three-dimensional simulation results with averaged parameters (long dashed line).

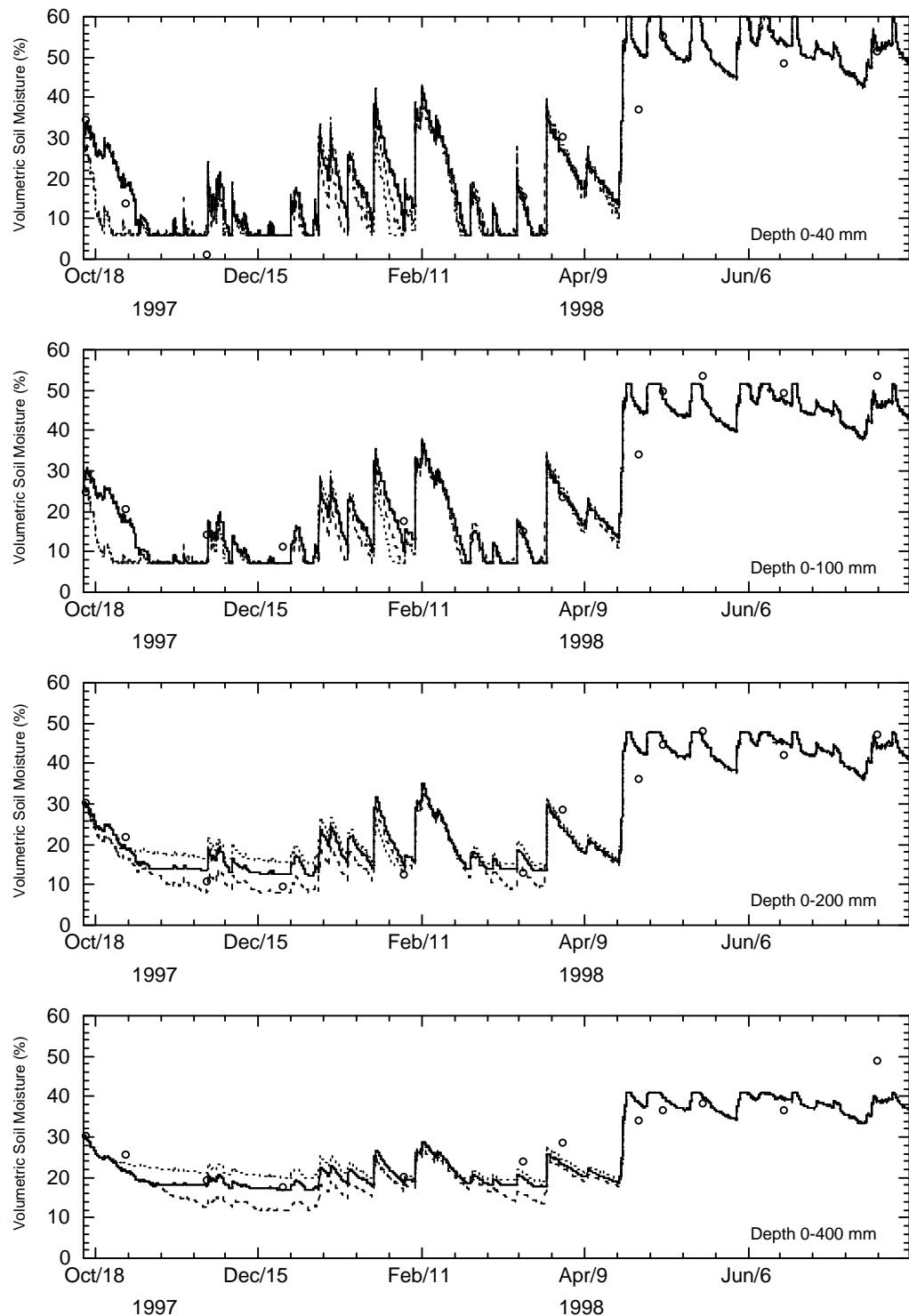


Figure F.10: Calibration results from soil moisture profile number 10. Connector TDR observations (open circles) are compared against one-dimensional simulation results with calibrated parameters (solid line) and averaged parameters (short dashed line), and three-dimensional simulation results with averaged parameters (long dashed line).

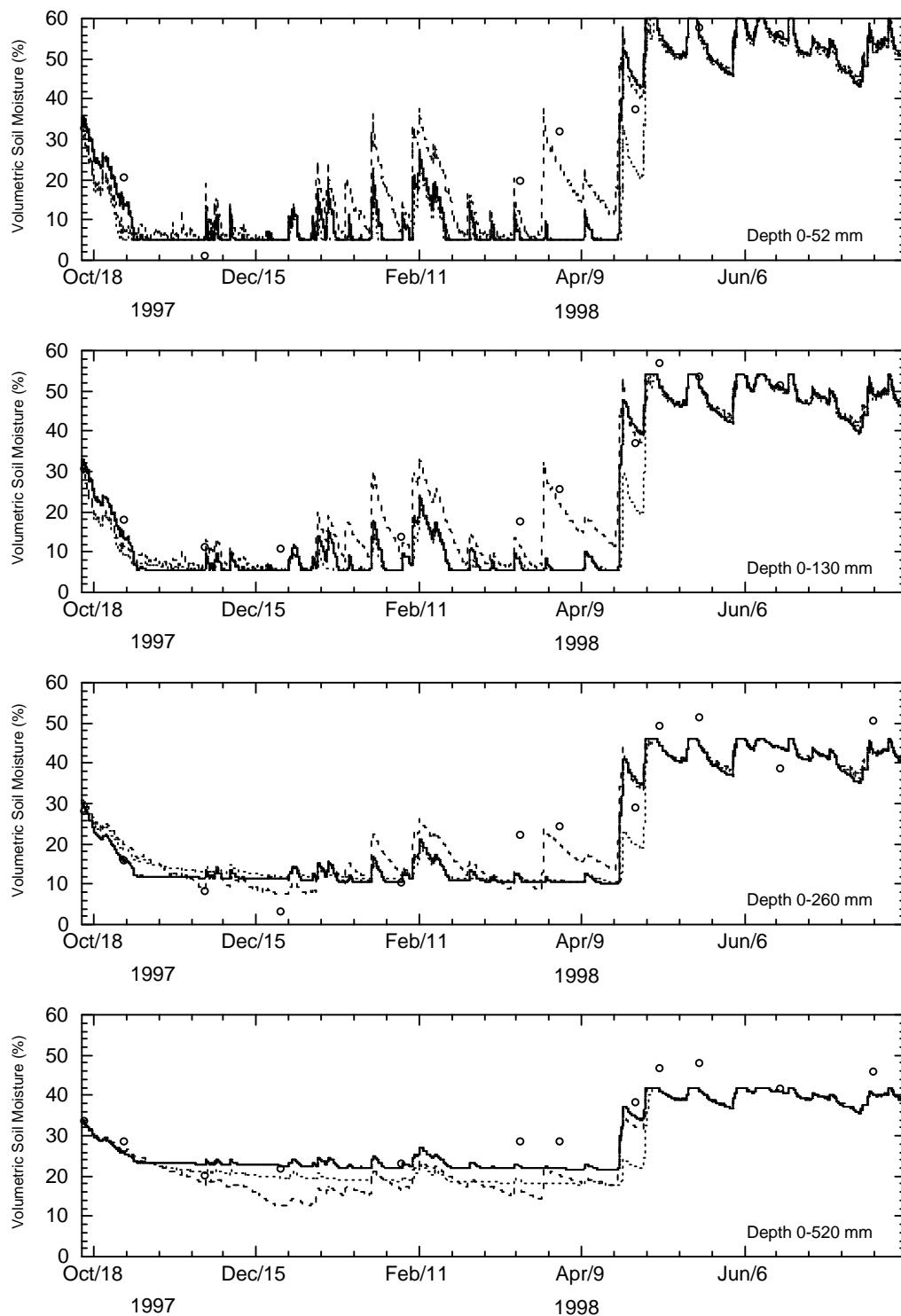


Figure F.11: Calibration results from soil moisture profile number 11. Connector TDR observations (open circles) are compared against one-dimensional simulation results with calibrated parameters (solid line) and averaged parameters (short dashed line), and three-dimensional simulation results with averaged parameters (long dashed line).

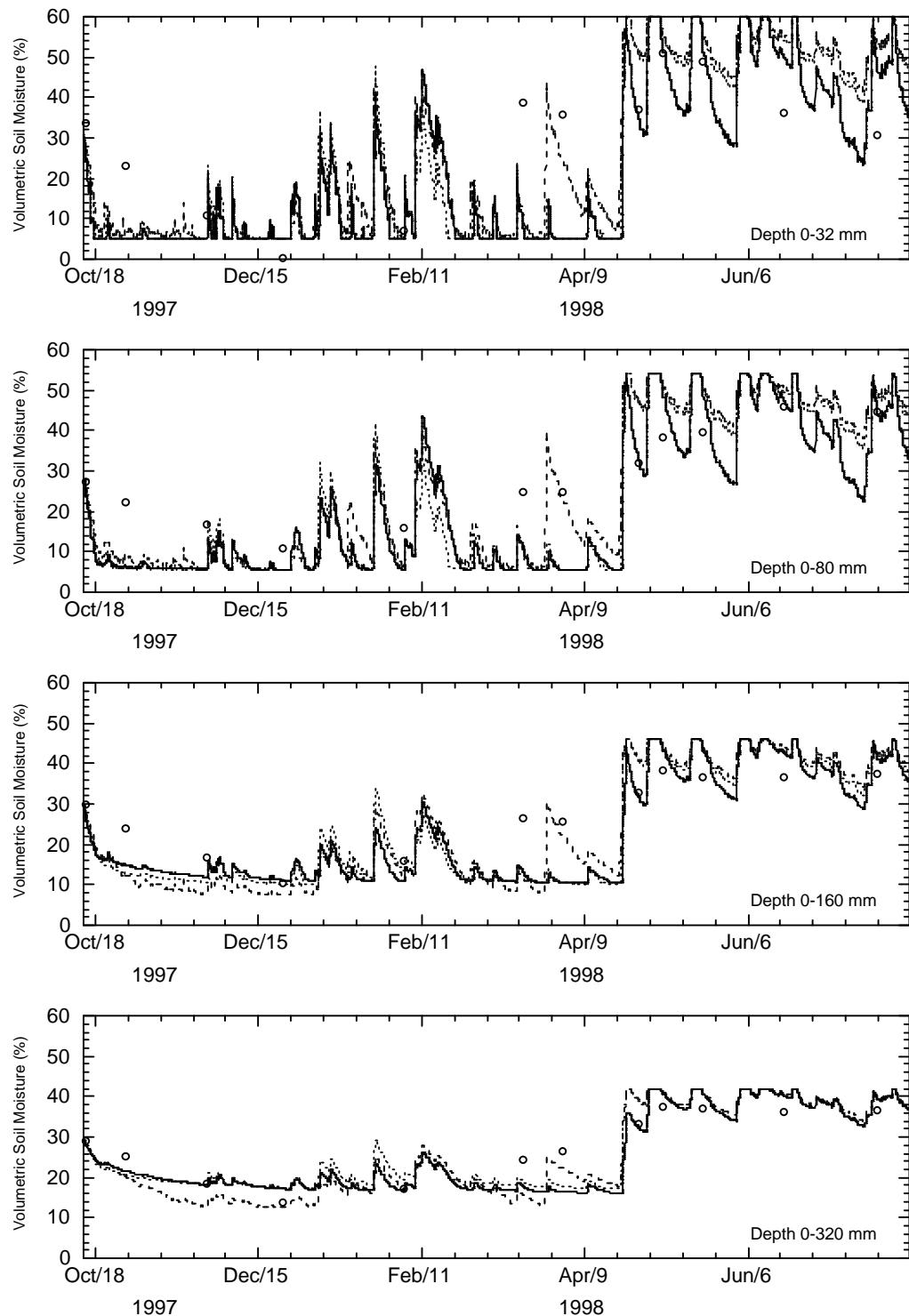


Figure F.12: Calibration results from soil moisture profile number 12. Connector TDR observations (open circles) are compared against one-dimensional simulation results with calibrated parameters (solid line) and averaged parameters (short dashed line), and three-dimensional simulation results with averaged parameters (long dashed line).

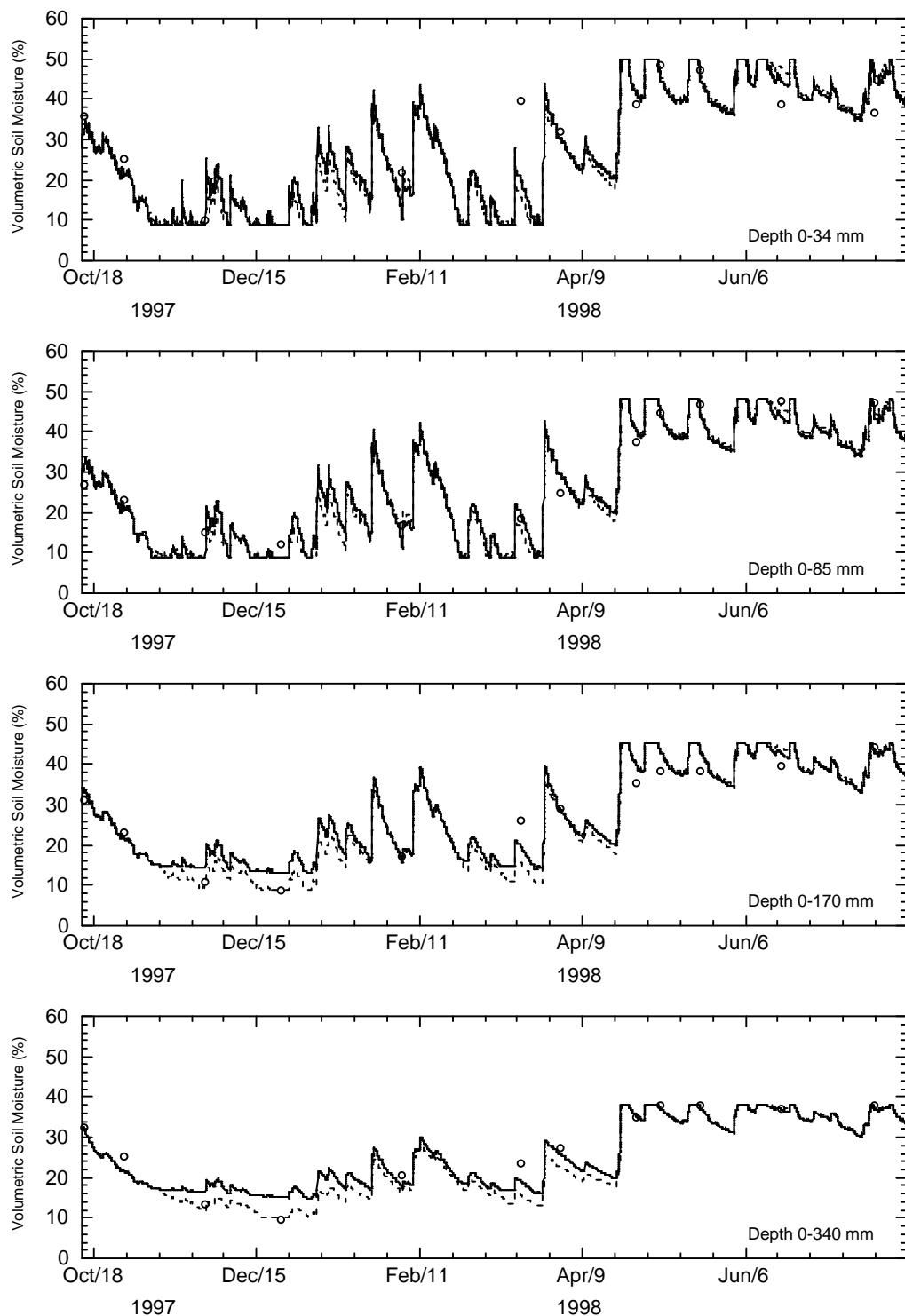


Figure F.13: Calibration results from soil moisture profile number 13. Connector TDR observations (open circles) are compared against one-dimensional simulation results with calibrated parameters (solid line) and averaged parameters (short dashed line), and three-dimensional simulation results with averaged parameters (long dashed line).

F.2 EVALUATION OF ABDOMEN3D CALIBRATION

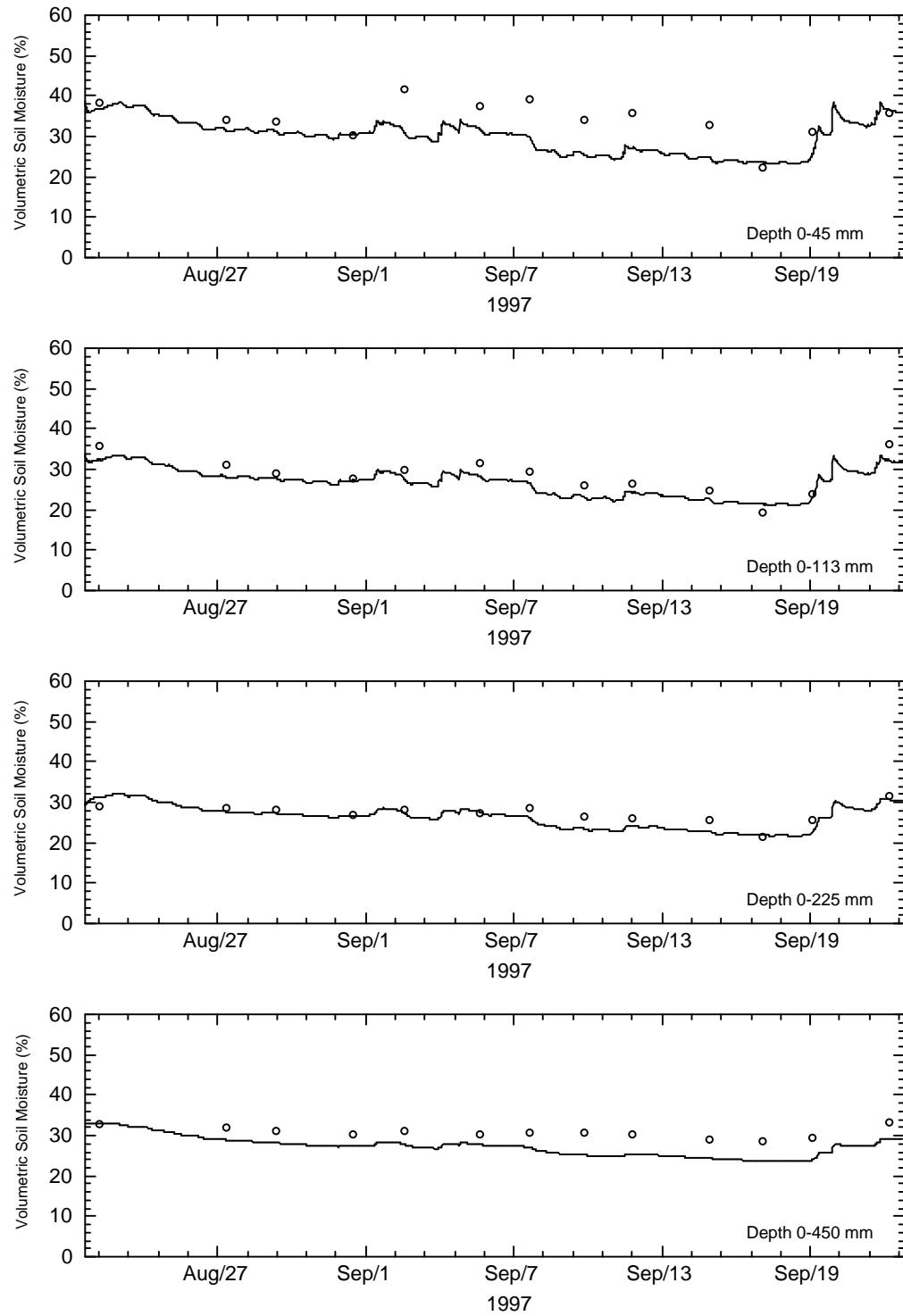


Figure F.14: Evaluation of soil moisture profile simulation at soil moisture profile number 1. Connector TDR soil moisture observations (open circles) are compared against three-dimensional simulation results with calibrated parameters (solid line).

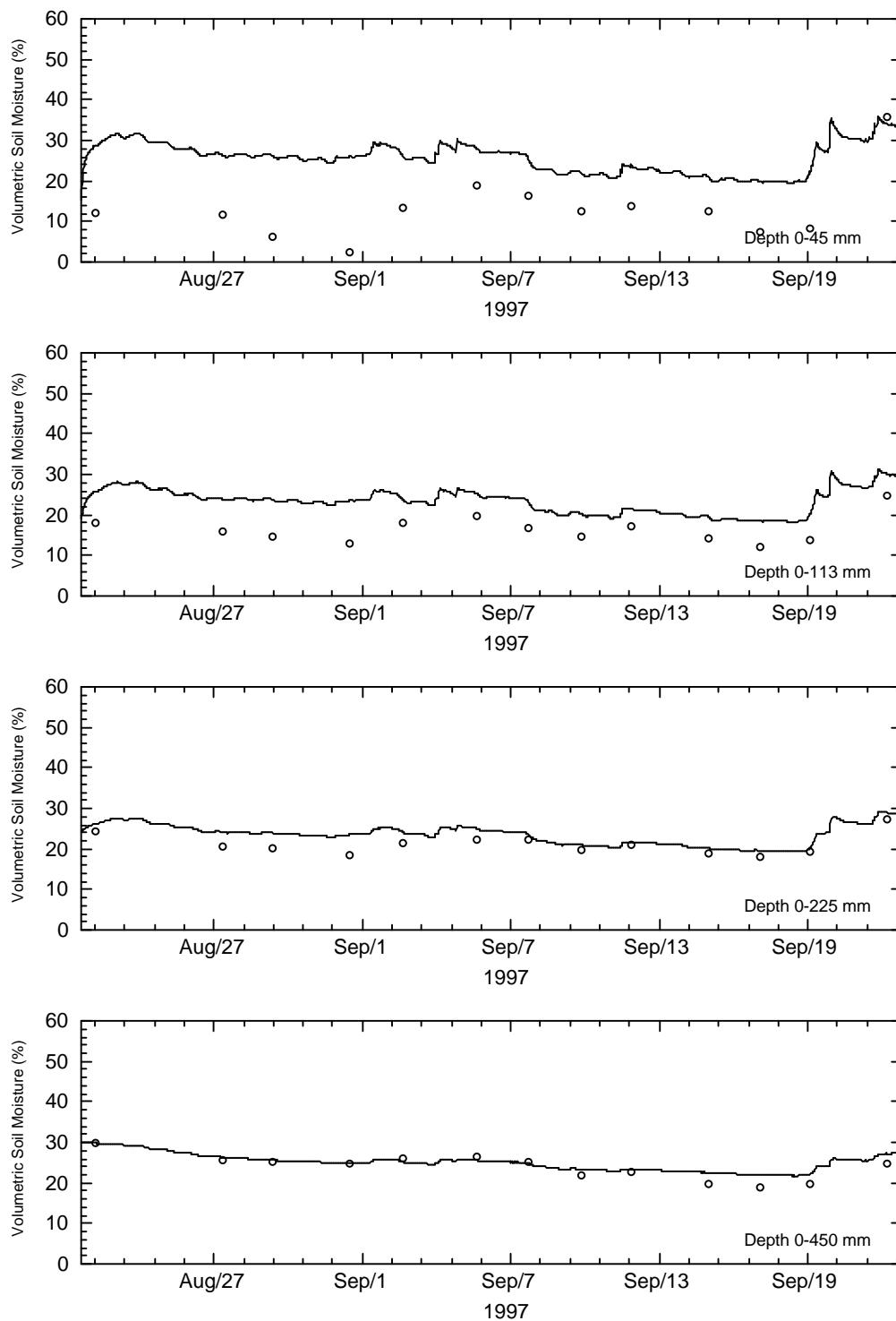


Figure F.15: Evaluation of soil moisture profile simulation at soil moisture profile number 5. Connector TDR soil moisture observations (open circles) are compared against three-dimensional simulation results with calibrated parameters (solid line).

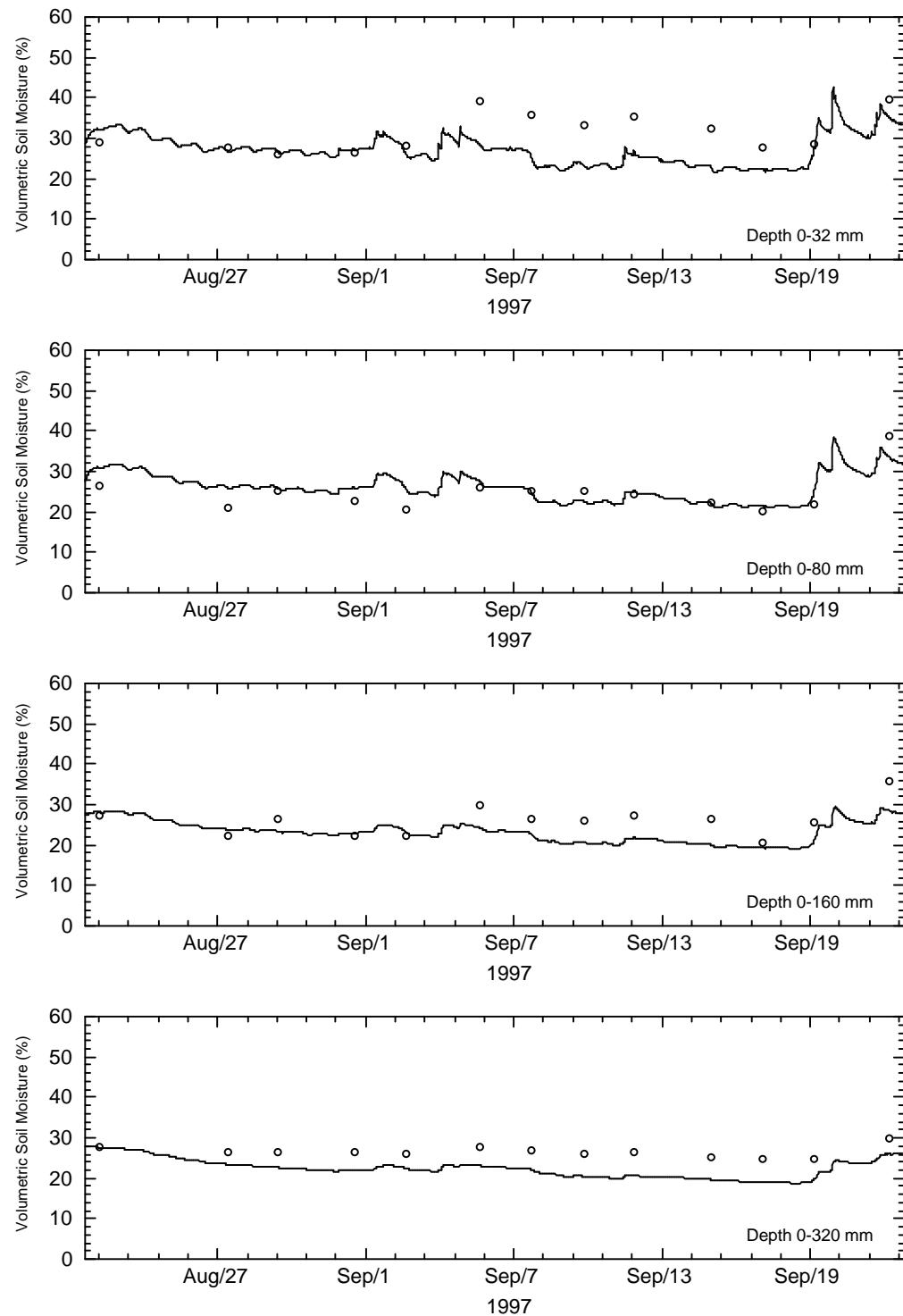


Figure F.16: Evaluation of soil moisture profile simulation at soil moisture profile number 3. Connector TDR soil moisture observations (open circles) are compared against three-dimensional simulation results with calibrated parameters (solid line).

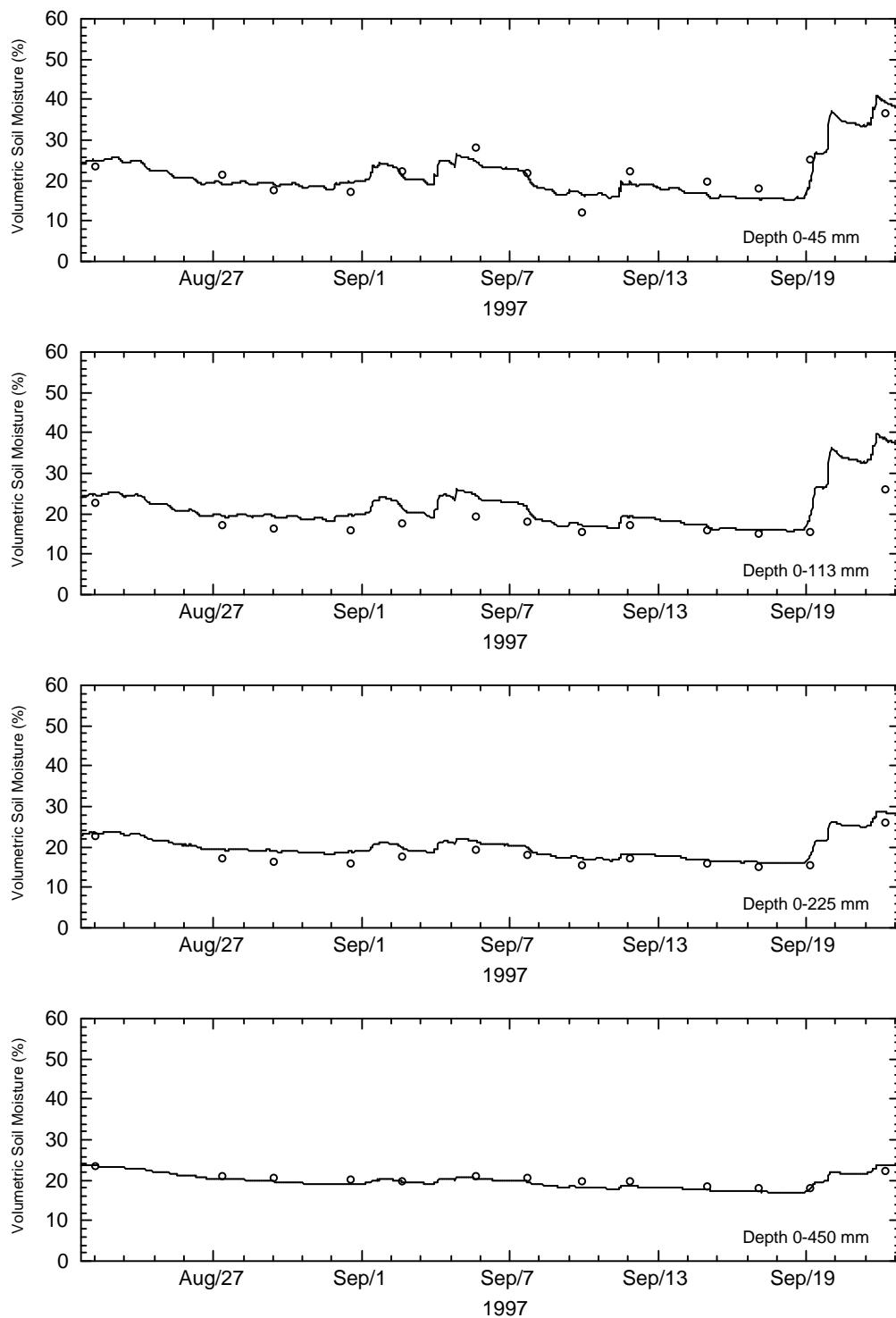


Figure F.17: Evaluation of soil moisture profile simulation at soil moisture profile number 4. Connector TDR soil moisture observations (open circles) are compared against three-dimensional simulation results with calibrated parameters (solid line).

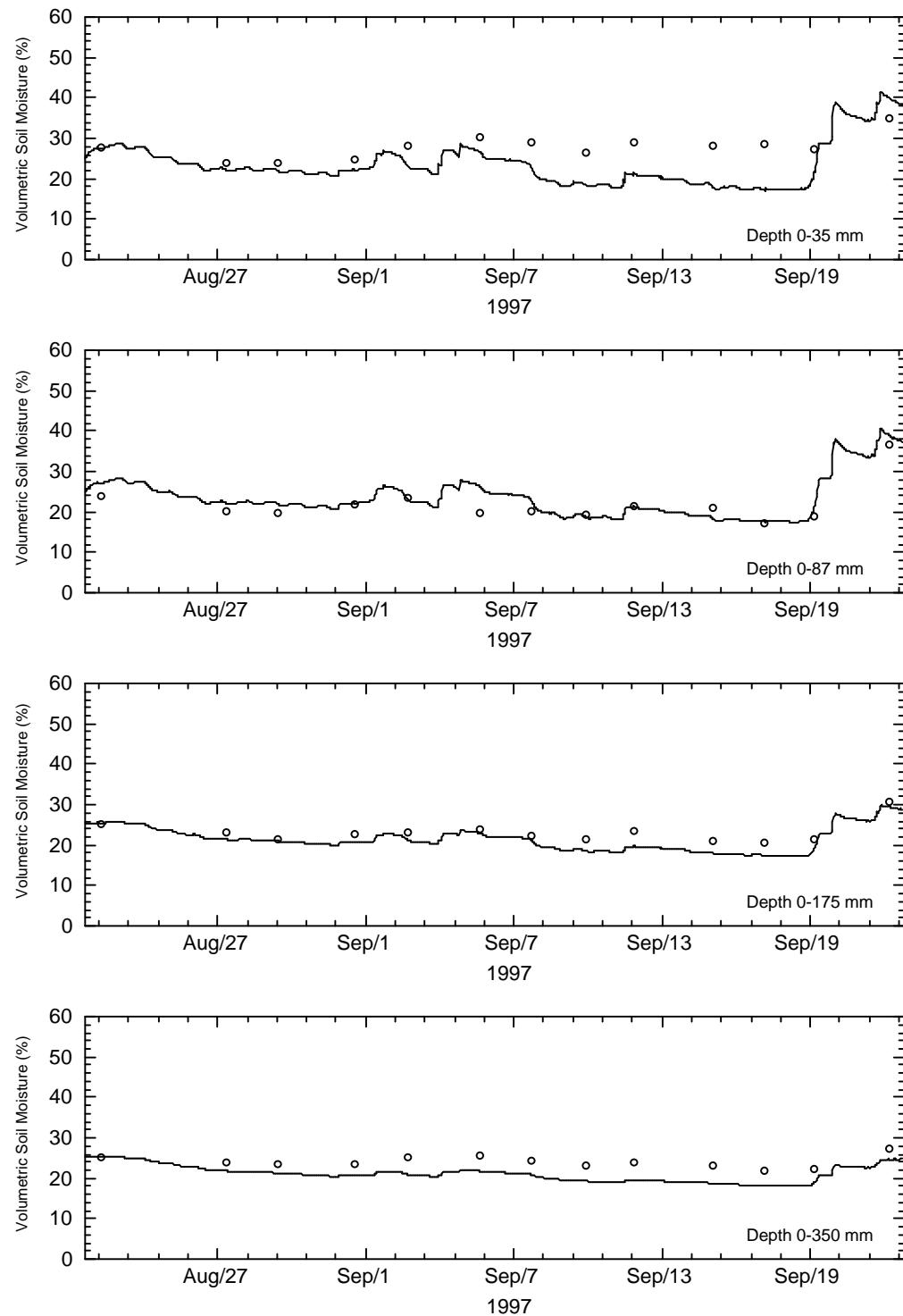


Figure F.18: Evaluation of soil moisture profile simulation at soil moisture profile number 5. Connector TDR soil moisture observations (open circles) are compared against three-dimensional simulation results with calibrated parameters (solid line).

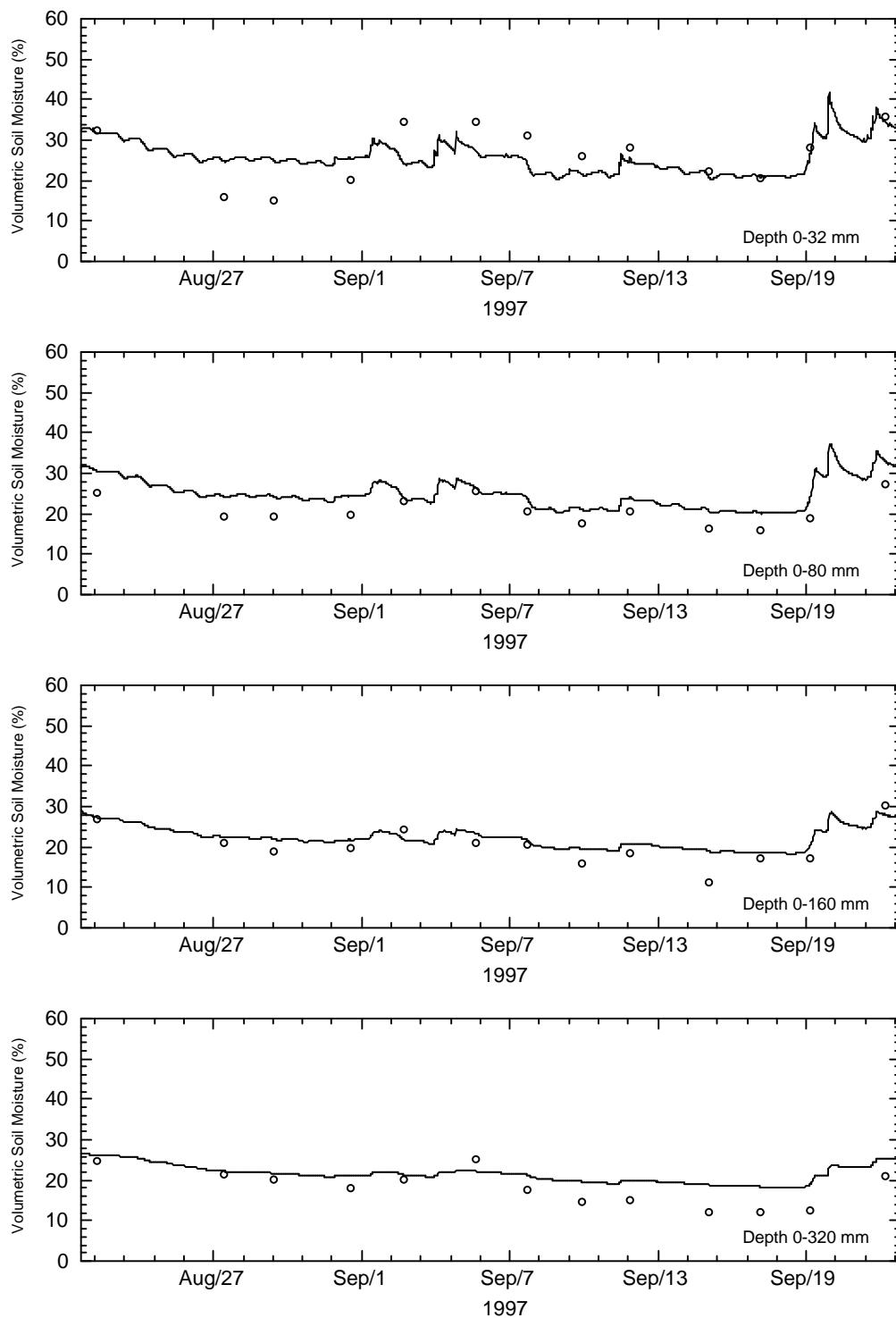


Figure F.19: Evaluation of soil moisture profile simulation at soil moisture profile number 6. Connector TDR soil moisture observations (open circles) are compared against three-dimensional simulation results with calibrated parameters (solid line).

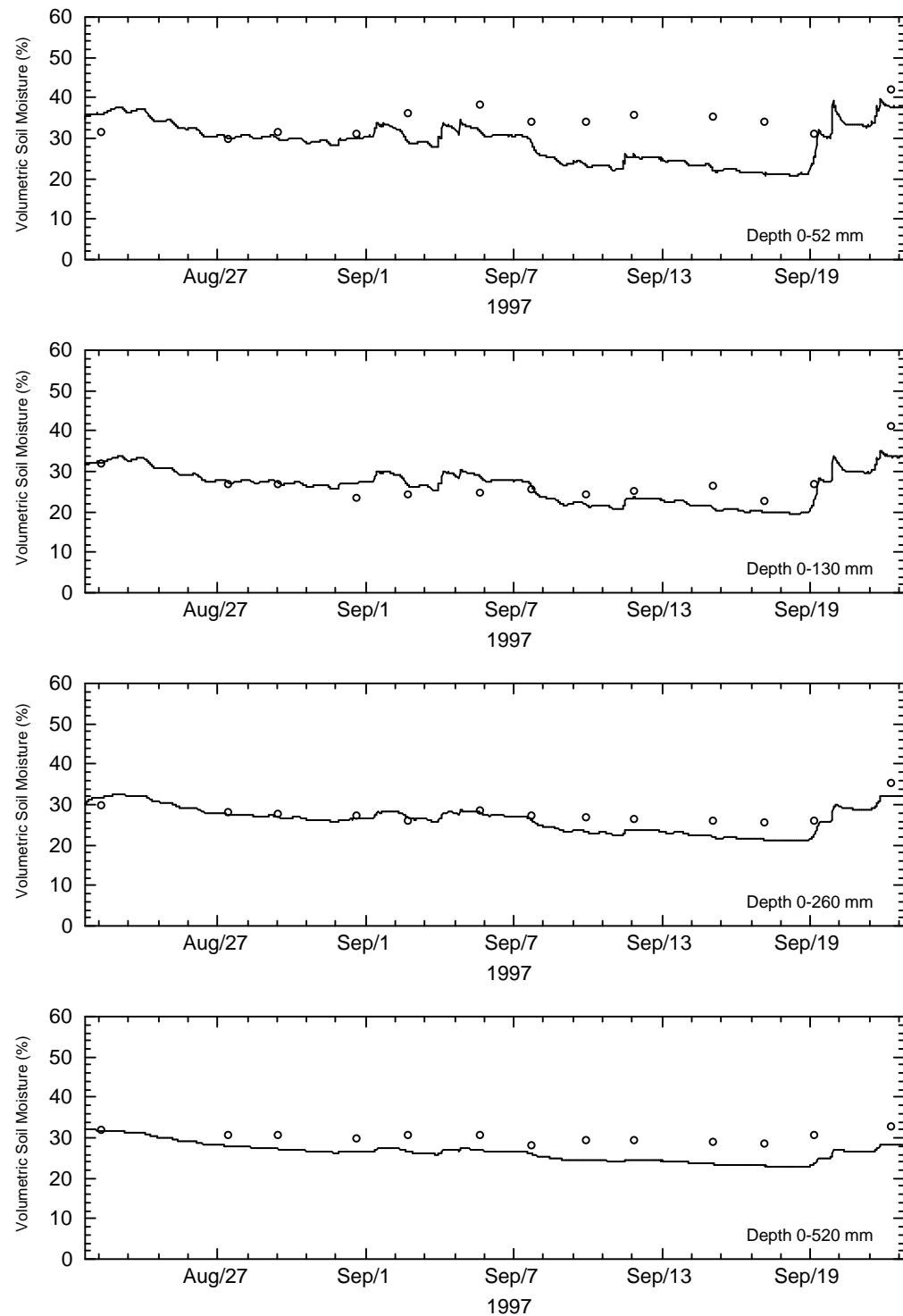


Figure F.20: Evaluation of soil moisture profile simulation at soil moisture profile number 7. Connector TDR soil moisture observations (open circles) are compared against three-dimensional simulation results with calibrated parameters (solid line).

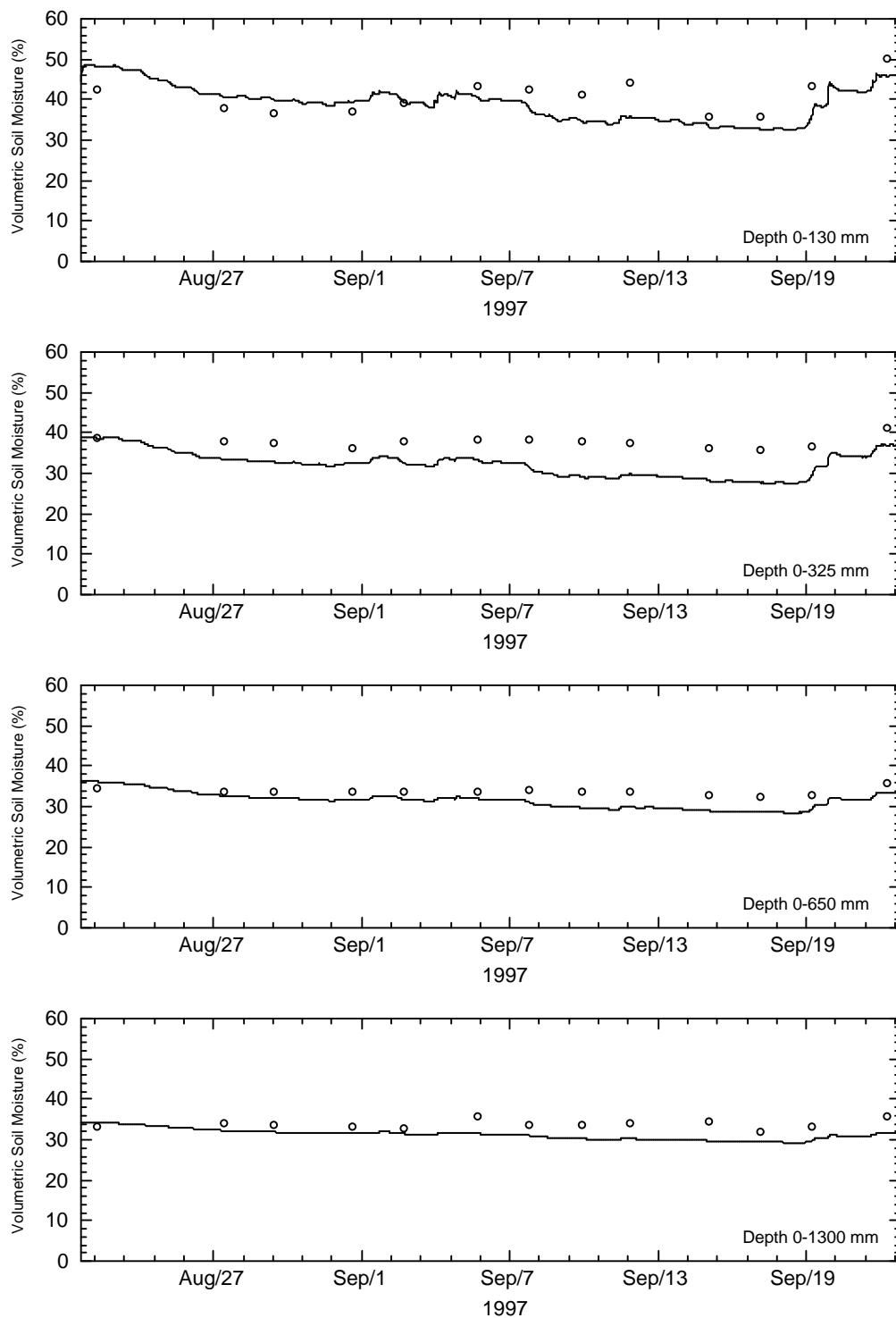


Figure F.21: Evaluation of soil moisture profile simulation at soil moisture profile number 8. Connector TDR soil moisture observations (open circles) are compared against three-dimensional simulation results with calibrated parameters (solid line).

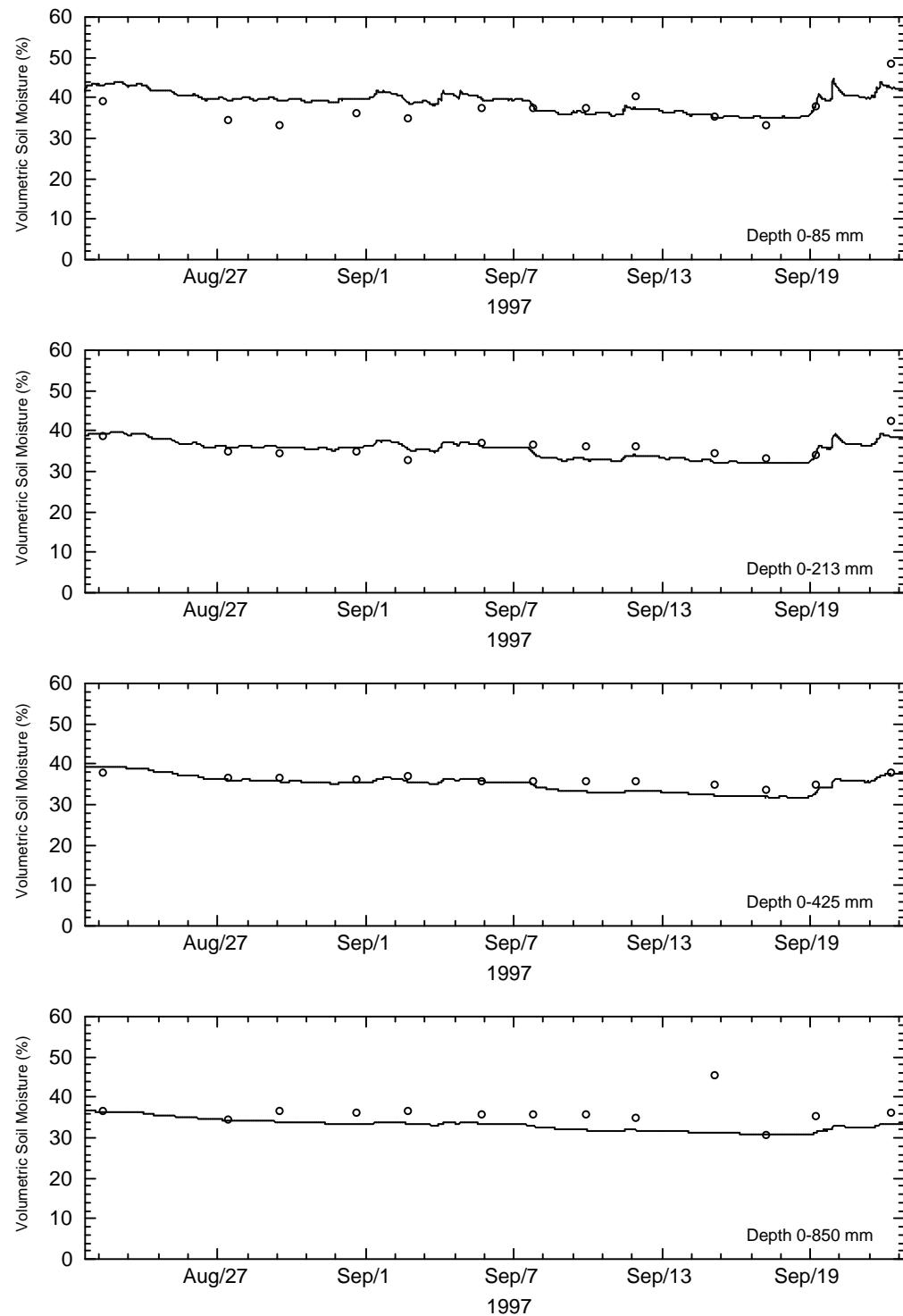


Figure F.22: Evaluation of soil moisture profile simulation at soil moisture profile number 9. Connector TDR soil moisture observations (open circles) are compared against three-dimensional simulation results with calibrated parameters (solid line).

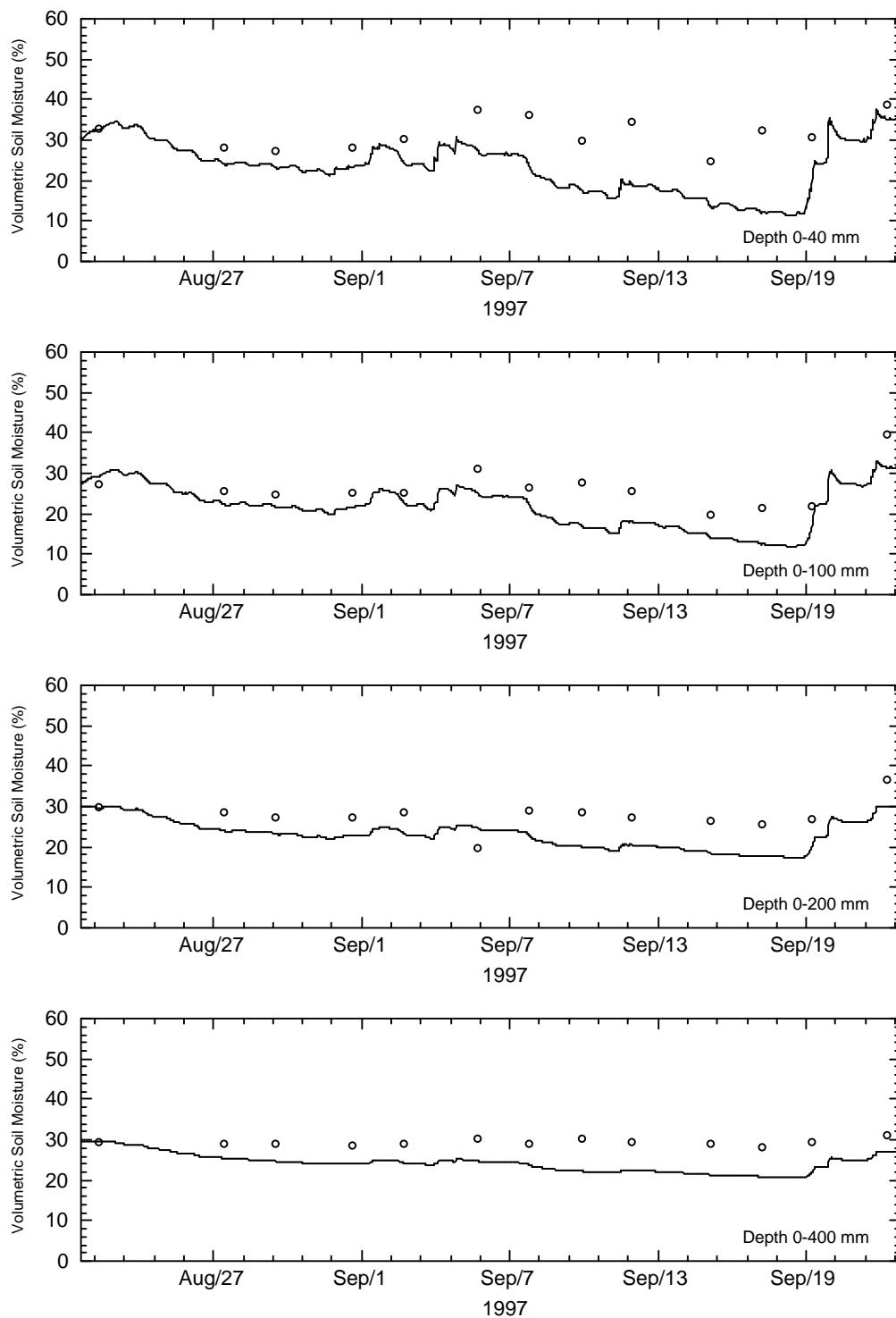


Figure F.23: Evaluation of soil moisture profile simulation at soil moisture profile number 10. Connector TDR soil moisture observations (open circles) are compared against three-dimensional simulation results with calibrated parameters (solid line).

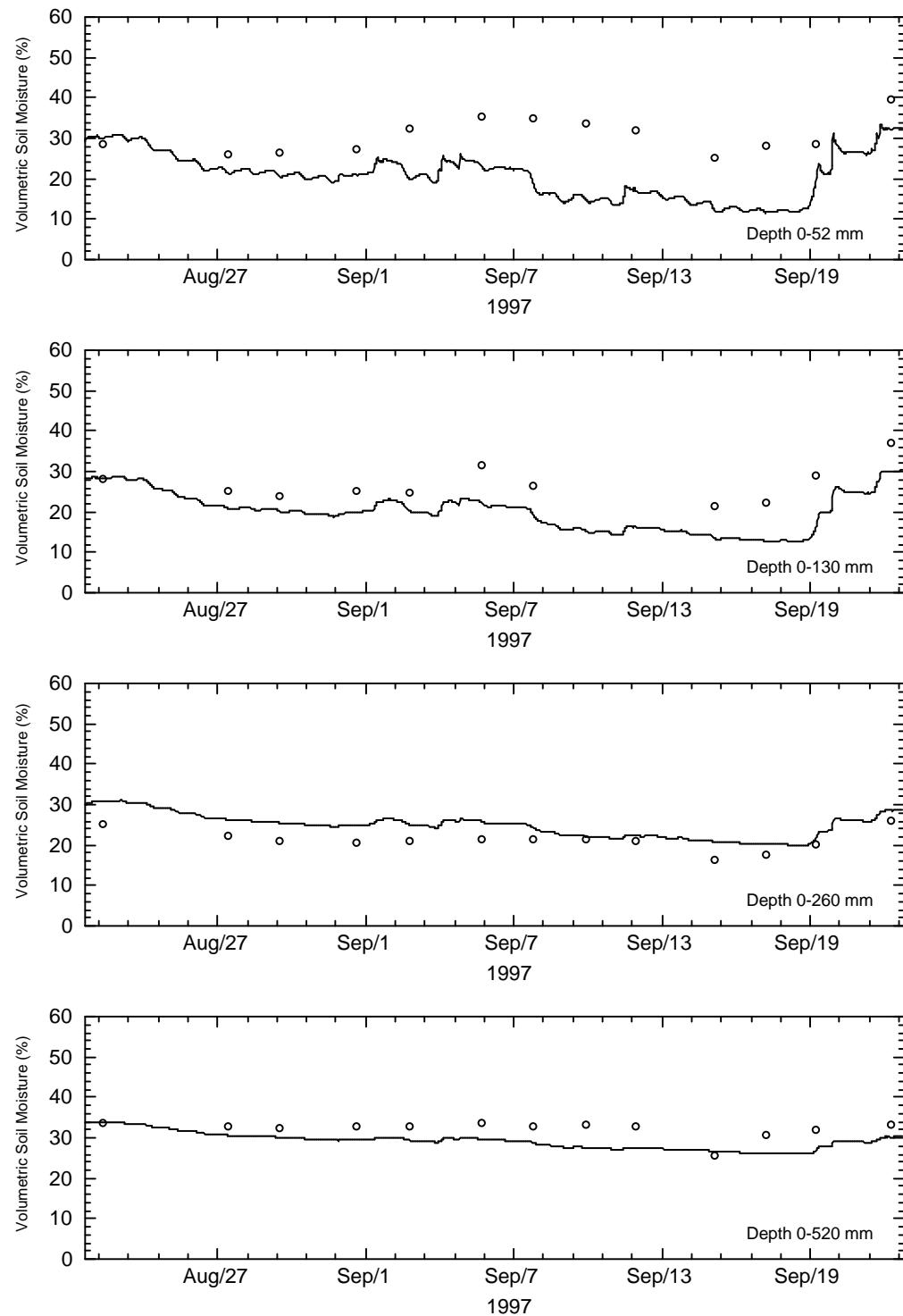


Figure F.24: Evaluation of soil moisture profile simulation at soil moisture profile number 11. Connector TDR soil moisture observations (open circles) are compared against three-dimensional simulation results with calibrated parameters (solid line).

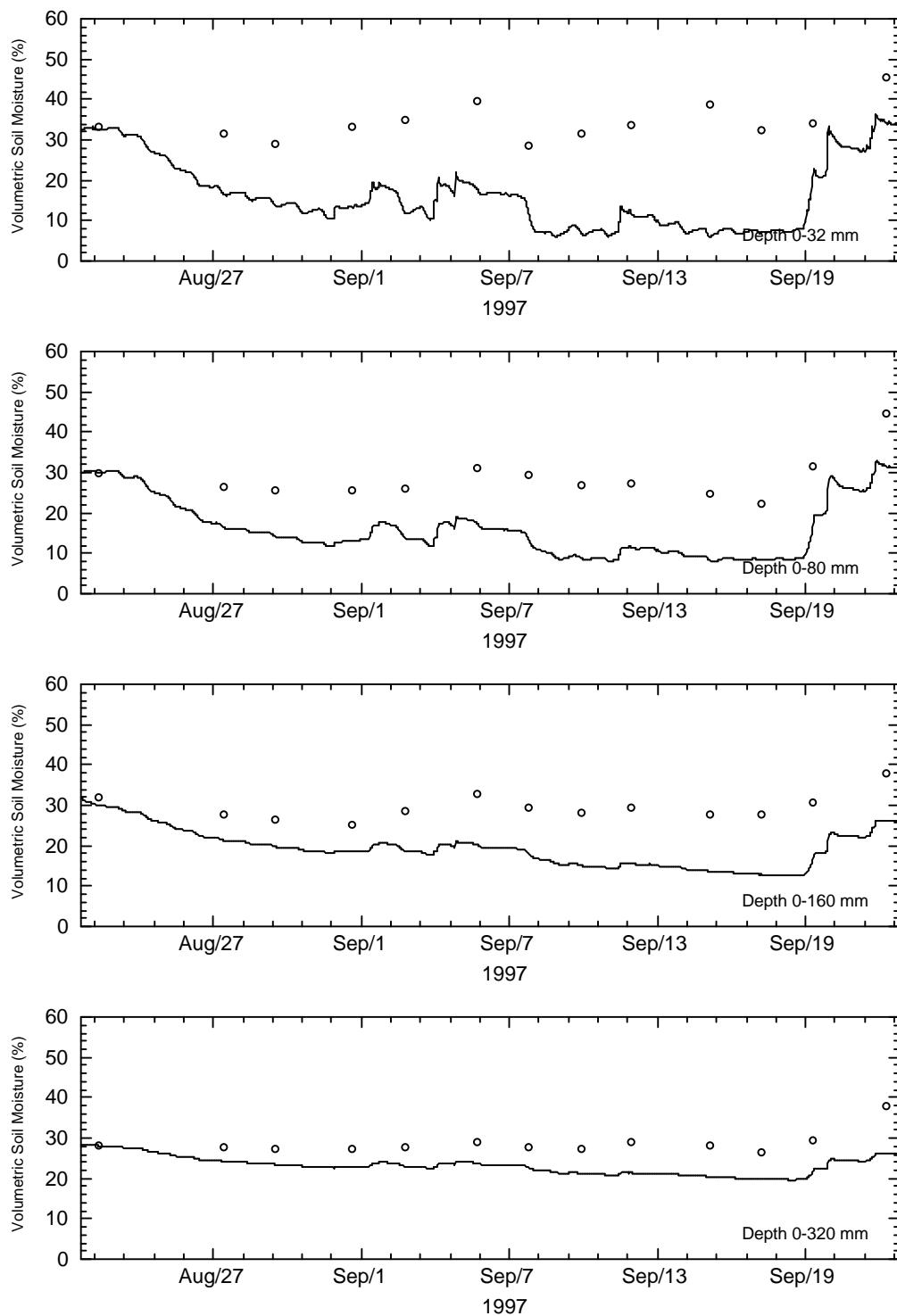


Figure F.25: Evaluation of soil moisture profile simulation at soil moisture profile number 12. Connector TDR soil moisture observations (open circles) are compared against three-dimensional simulation results with calibrated parameters (solid line).

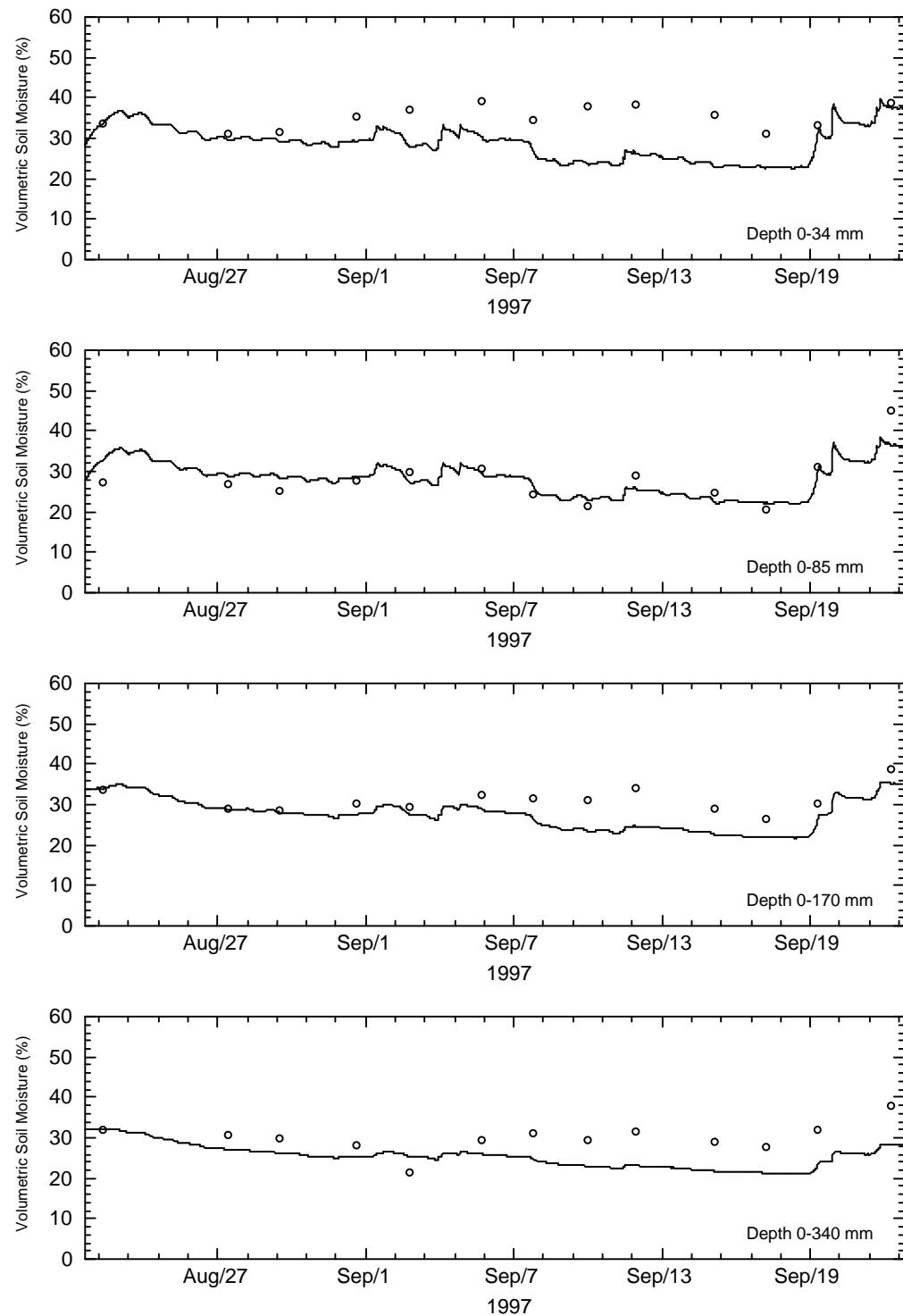


Figure F.26: Evaluation of soil moisture profile simulation at soil moisture profile number 13. Connector TDR soil moisture observations (open circles) are compared against three-dimensional simulation results with calibrated parameters (solid line).

F.3 SOIL MOISTURE PROFILE ESTIMATION

F.3.1 UPDATING WITH ORIGINAL TDAS OBSERVATIONS

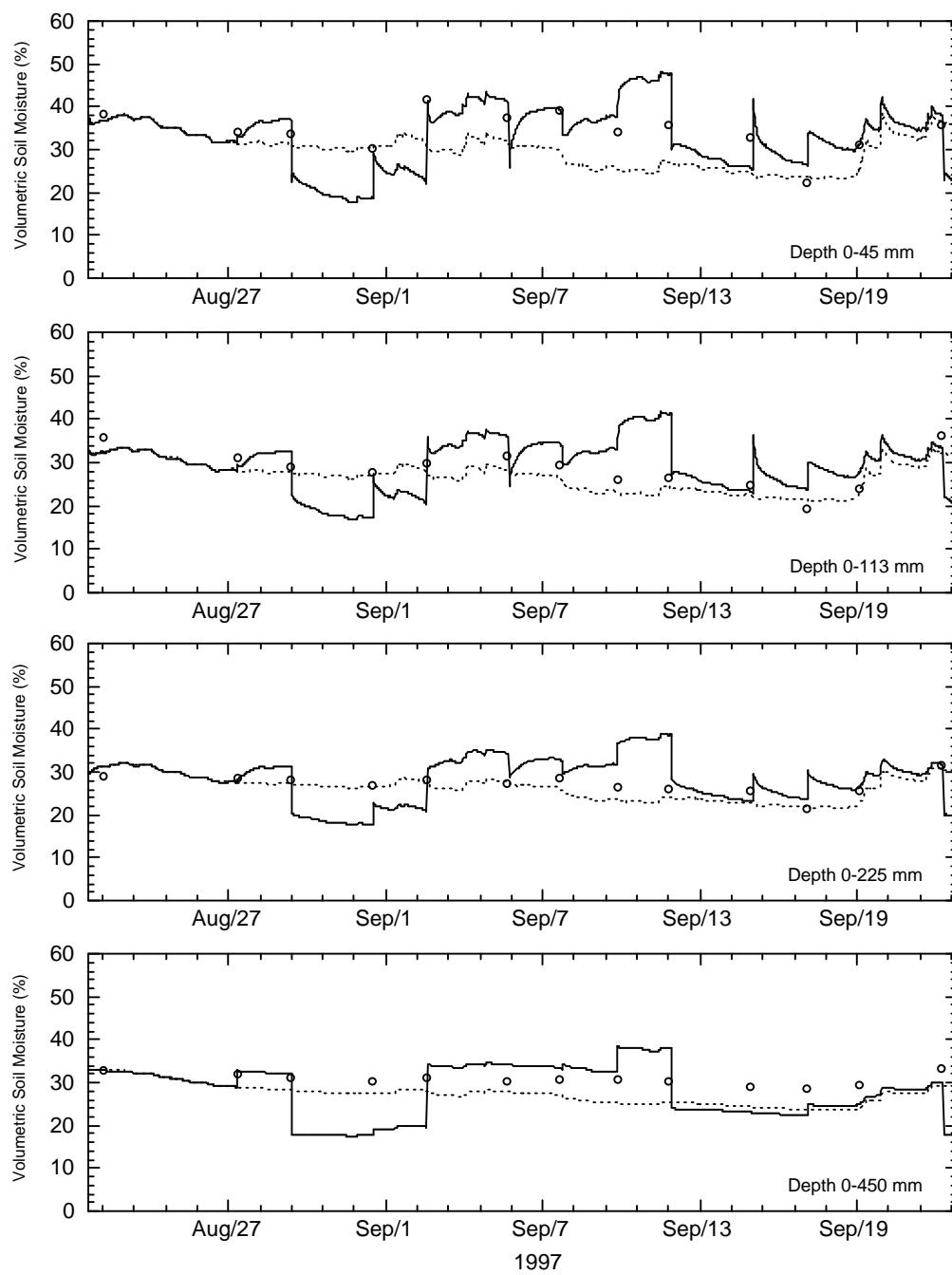


Figure F.27: Evaluation of soil moisture profile estimation at soil moisture profile number 1. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

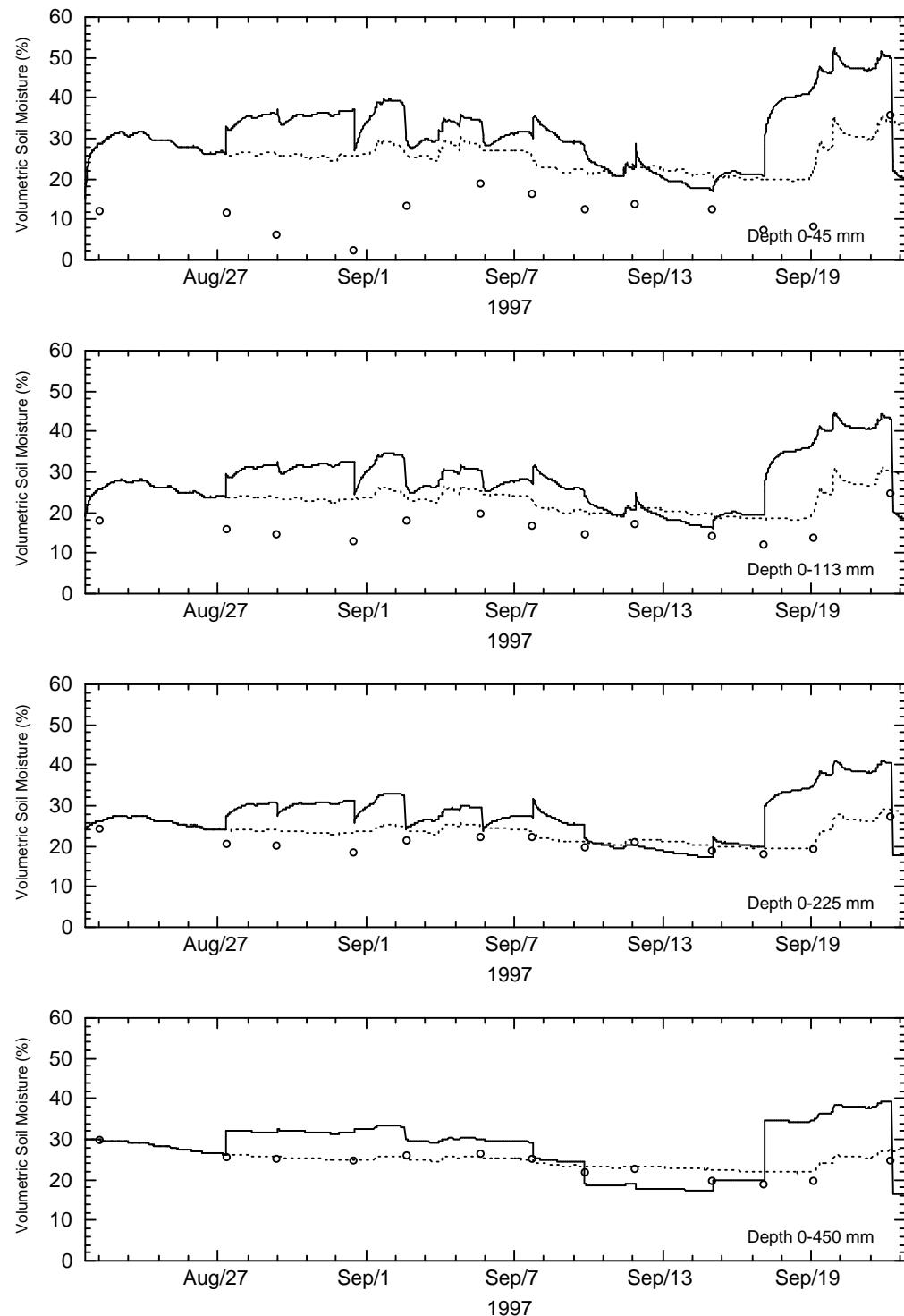


Figure F.28: Evaluation of soil moisture profile estimation at soil moisture profile number 2. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

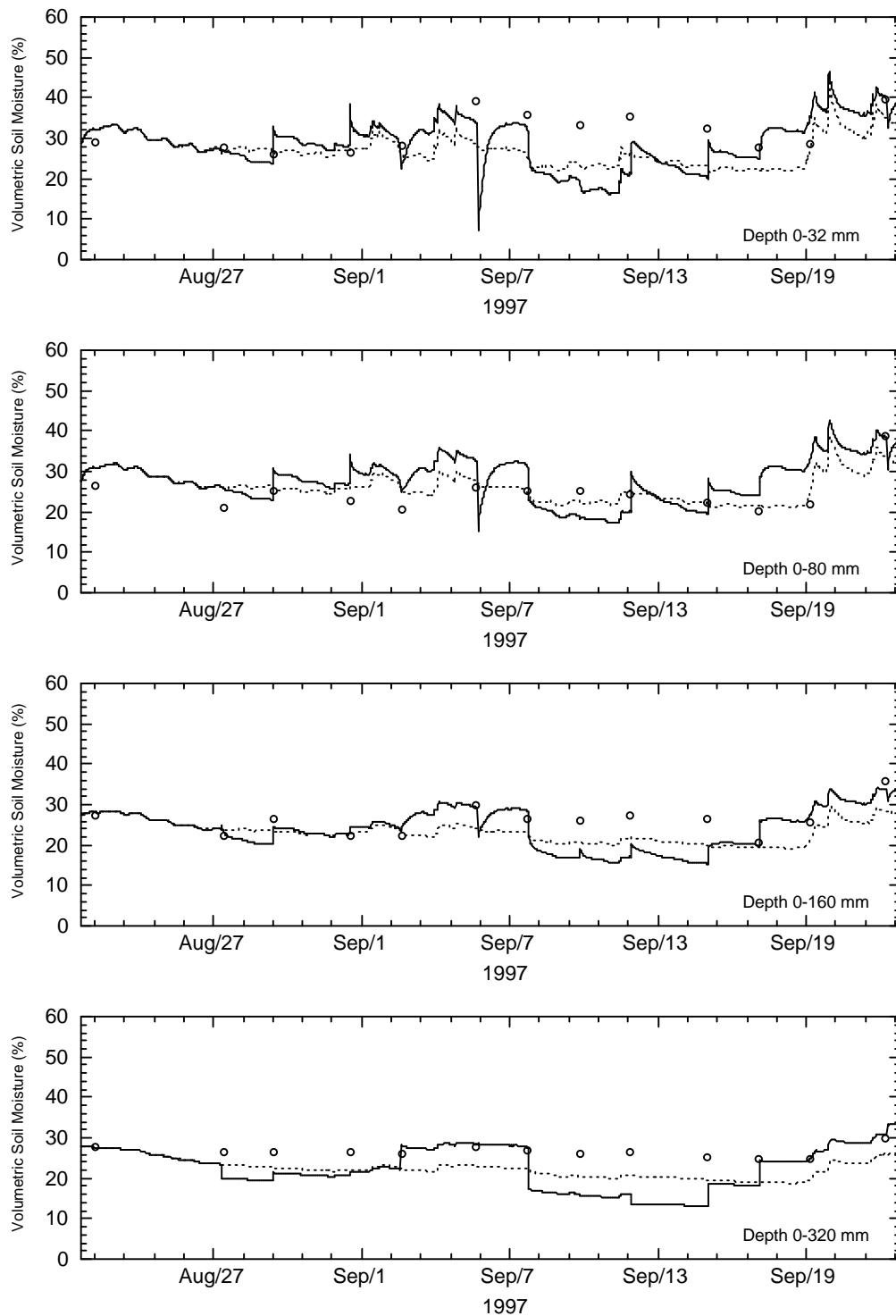


Figure F.29: Evaluation of soil moisture profile estimation at soil moisture profile number 3. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

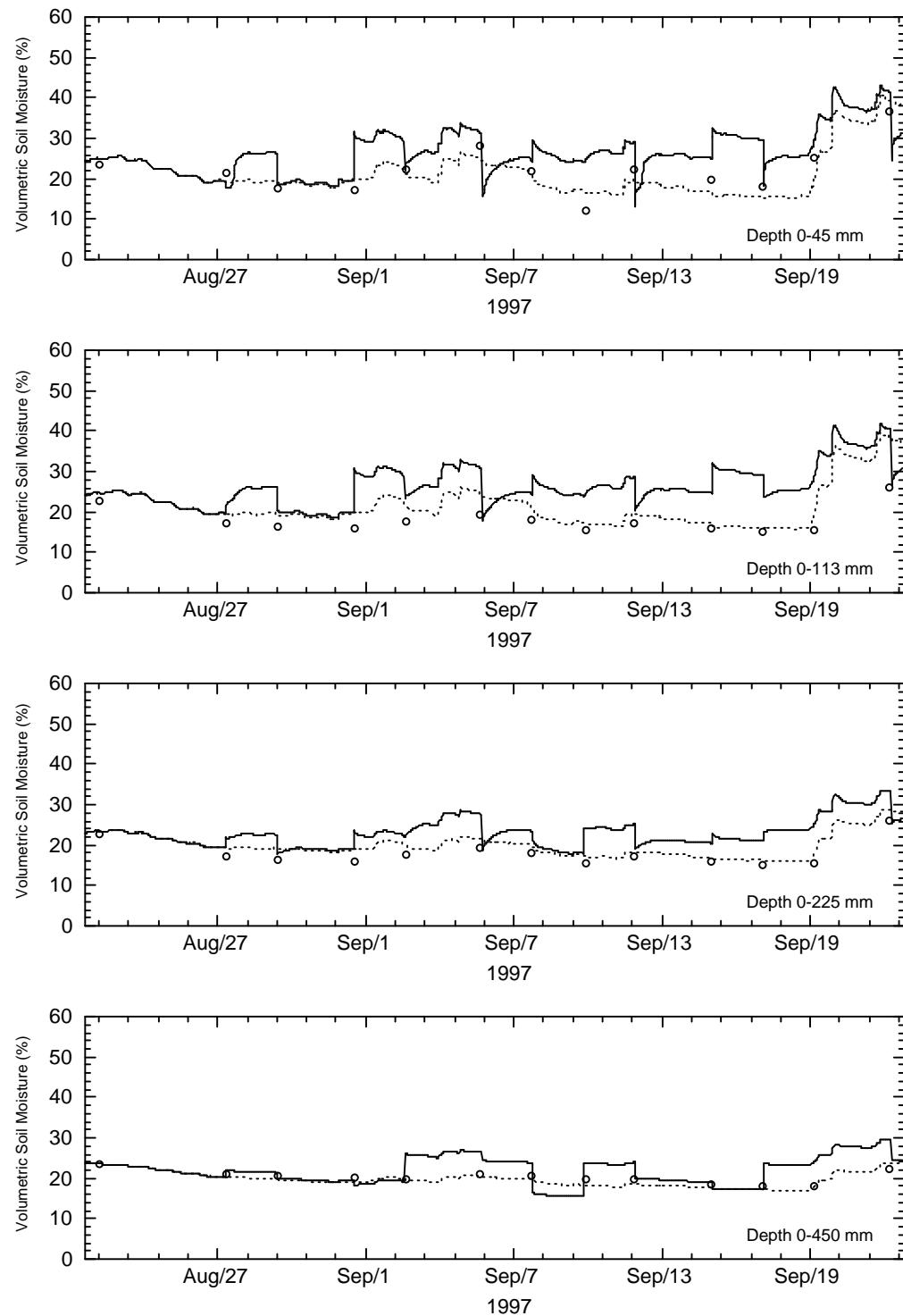


Figure F.30: Evaluation of soil moisture profile estimation at soil moisture profile number 4. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

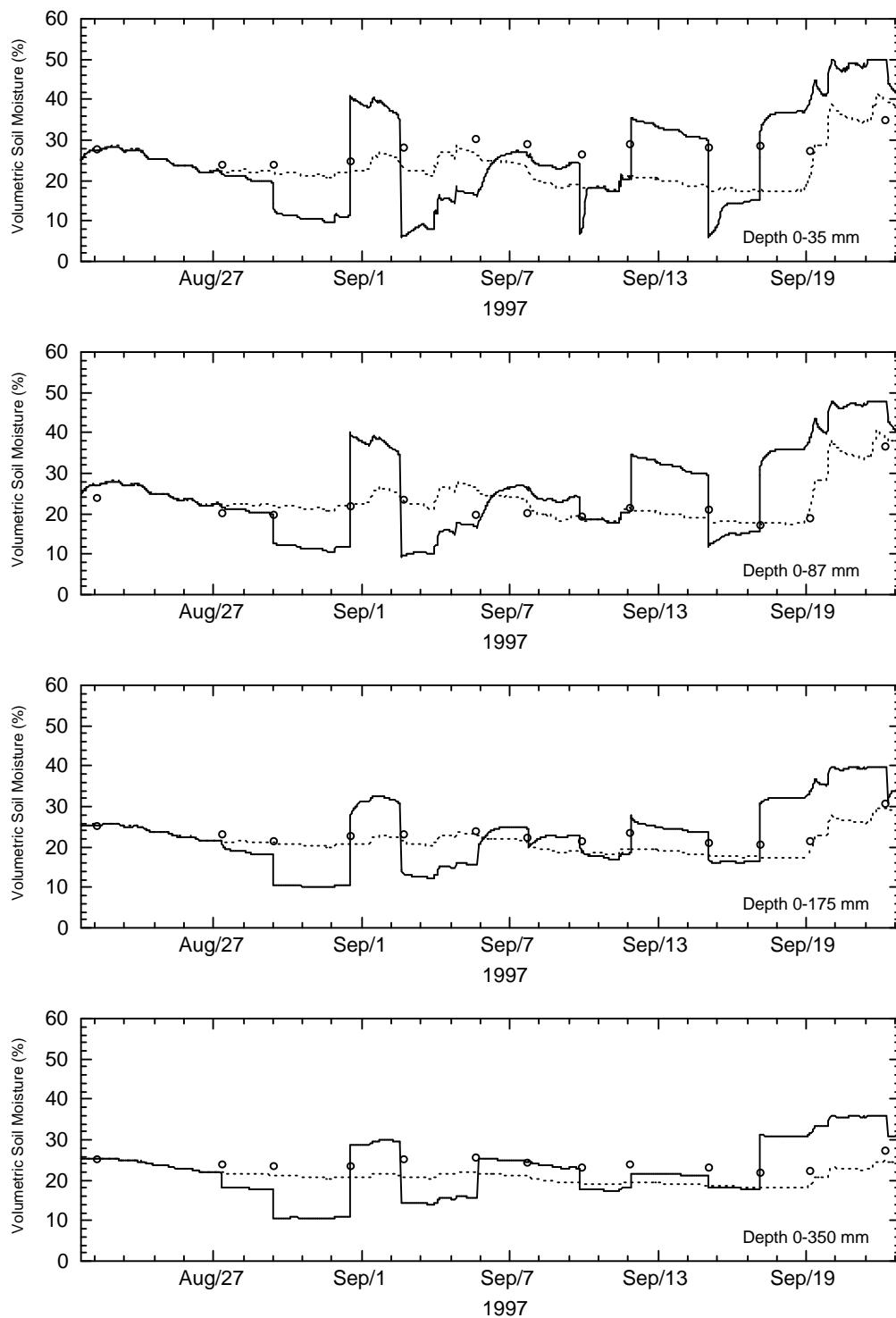


Figure F.31: Evaluation of soil moisture profile estimation at soil moisture profile number 5. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

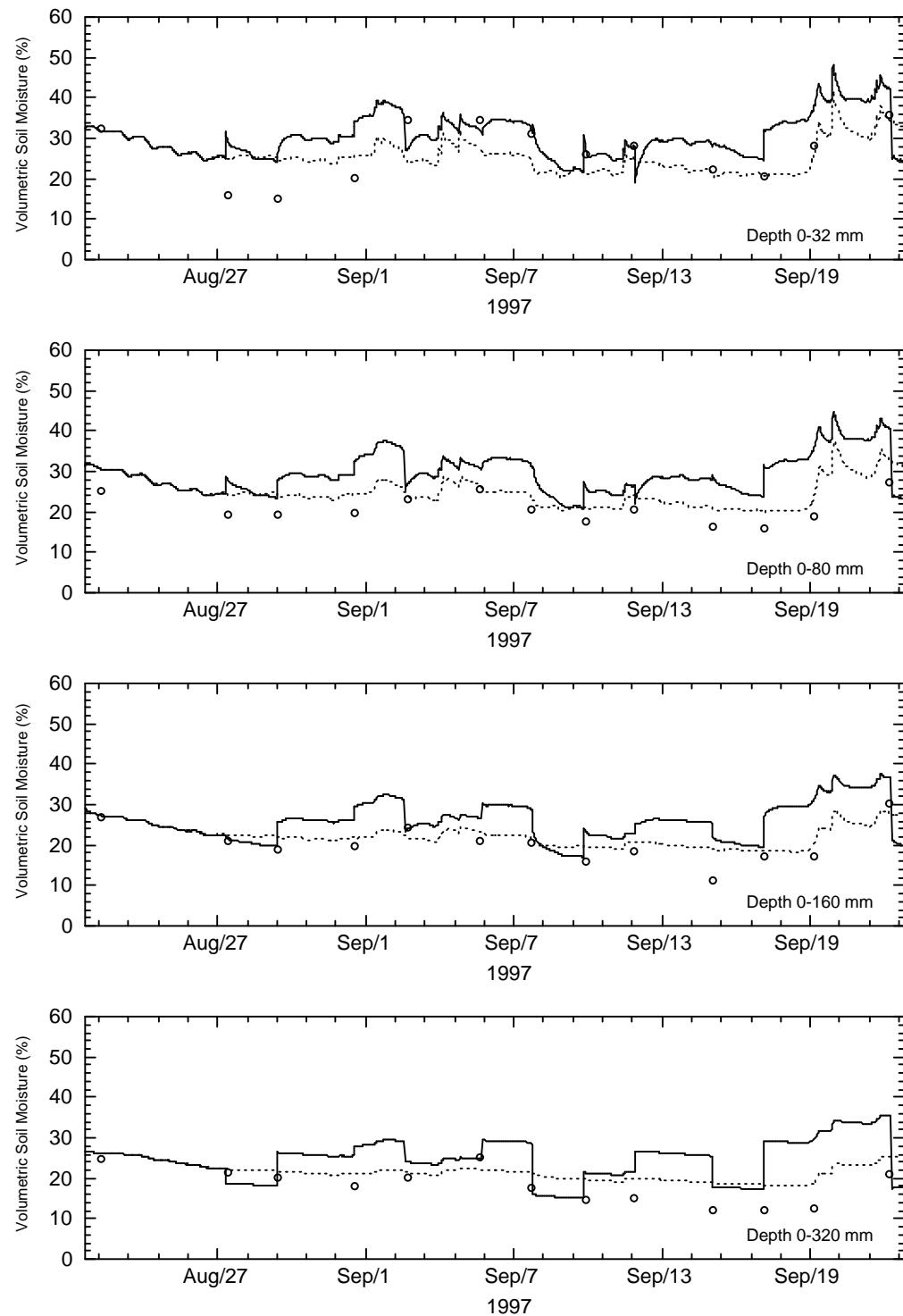


Figure F.32: Evaluation of soil moisture profile estimation at soil moisture profile number 6. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

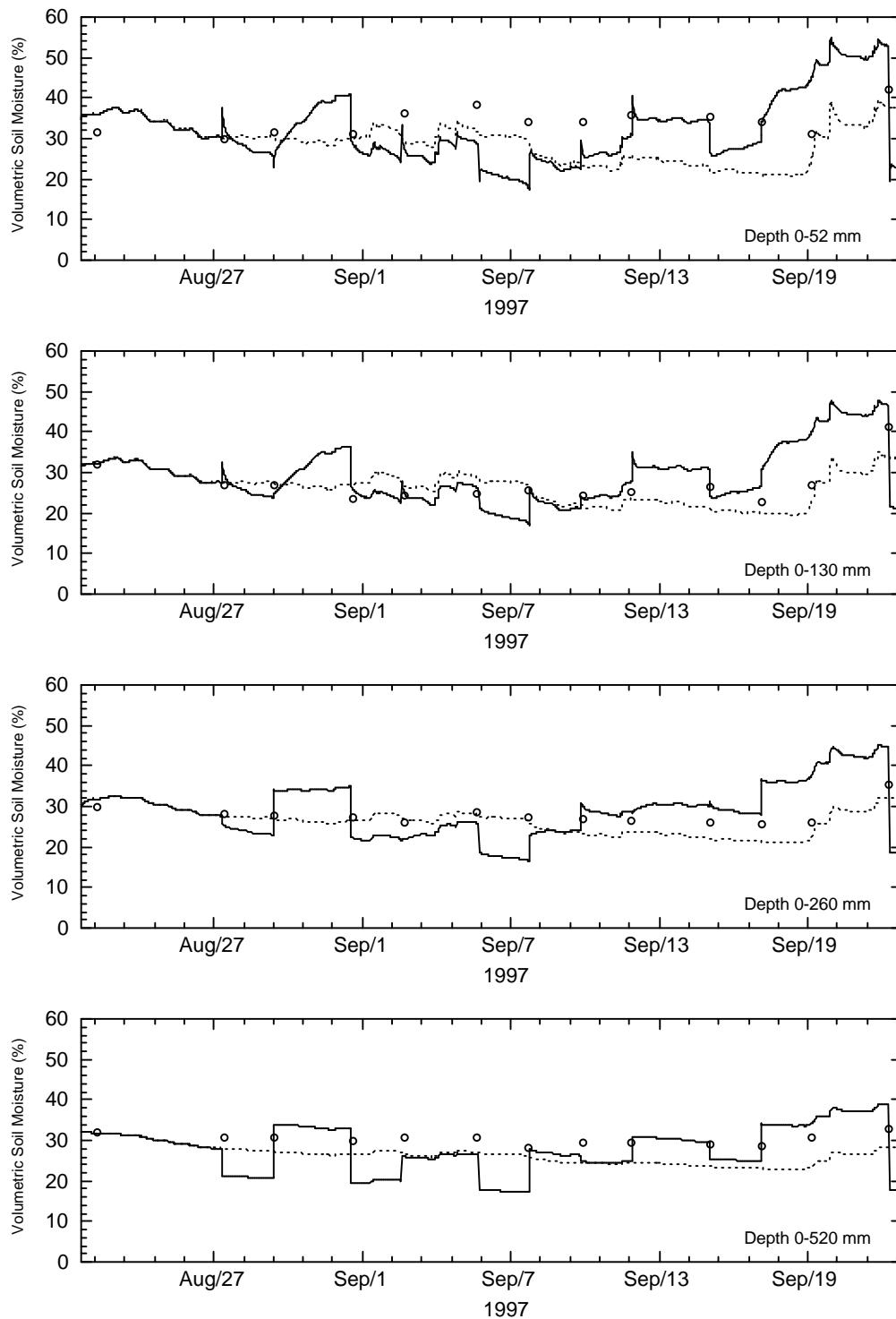


Figure F.33: Evaluation of soil moisture profile estimation at soil moisture profile number 7. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

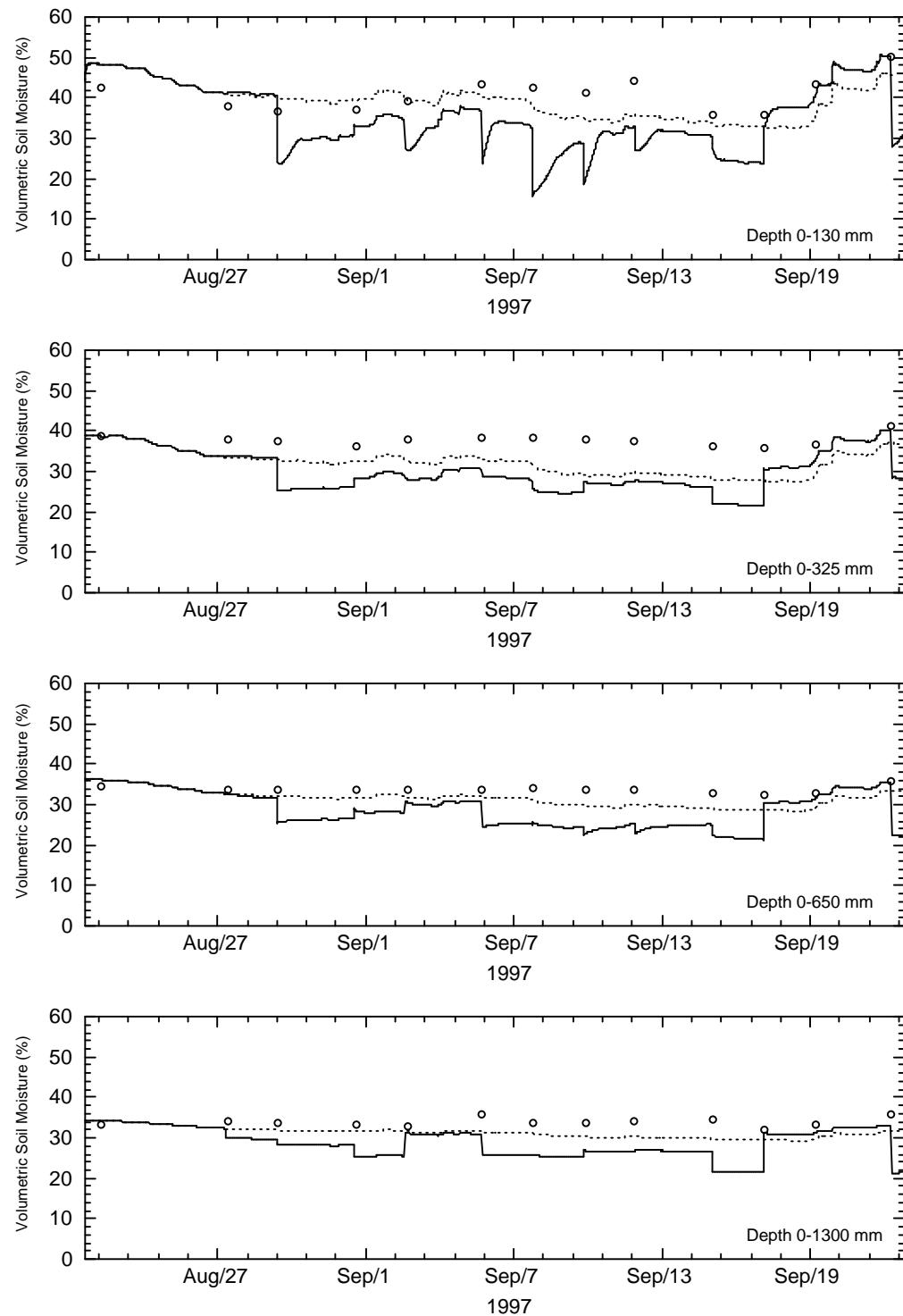


Figure F.34: Evaluation of soil moisture profile estimation at soil moisture profile number 8. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

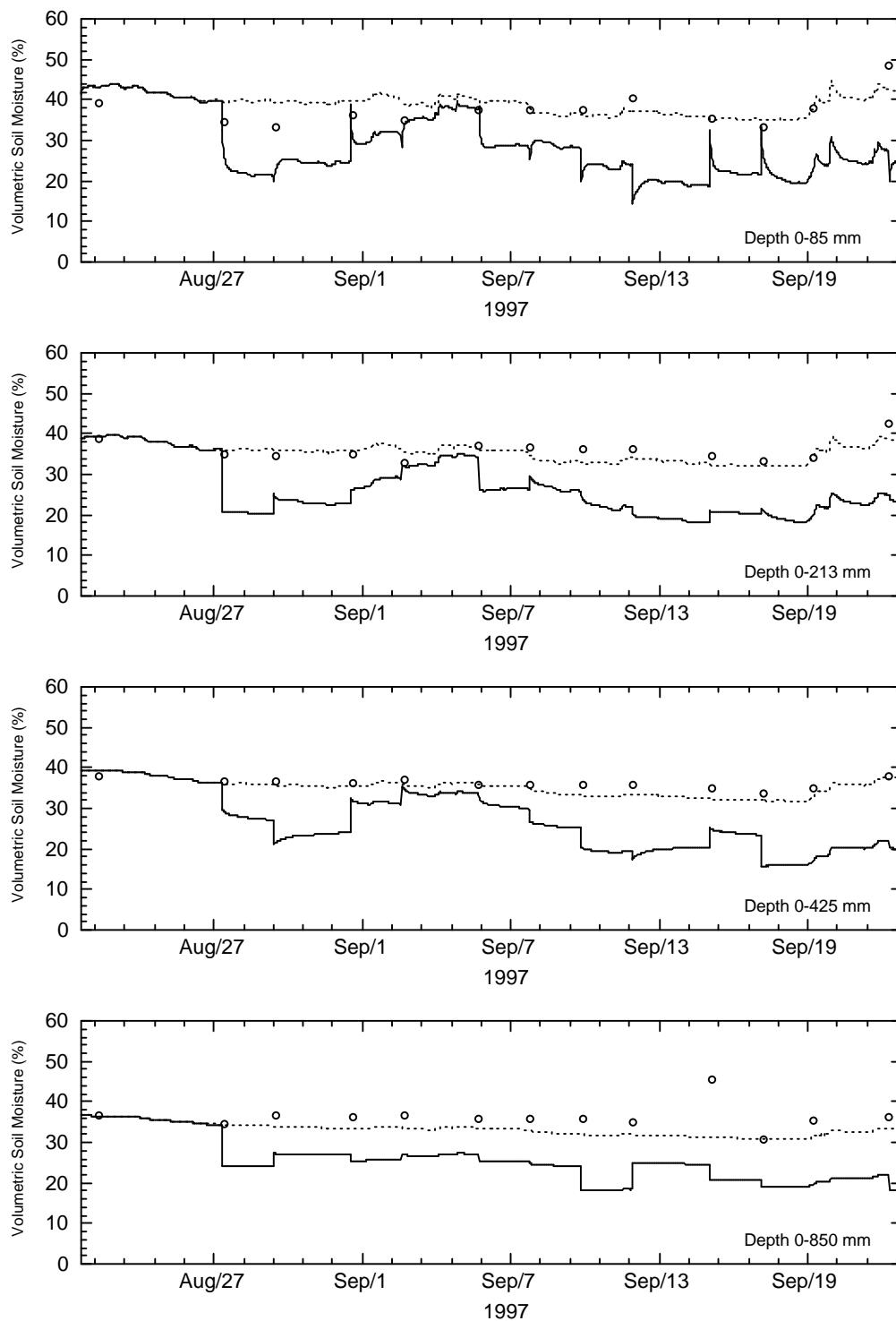


Figure F.35: Evaluation of soil moisture profile estimation at soil moisture profile number 9. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

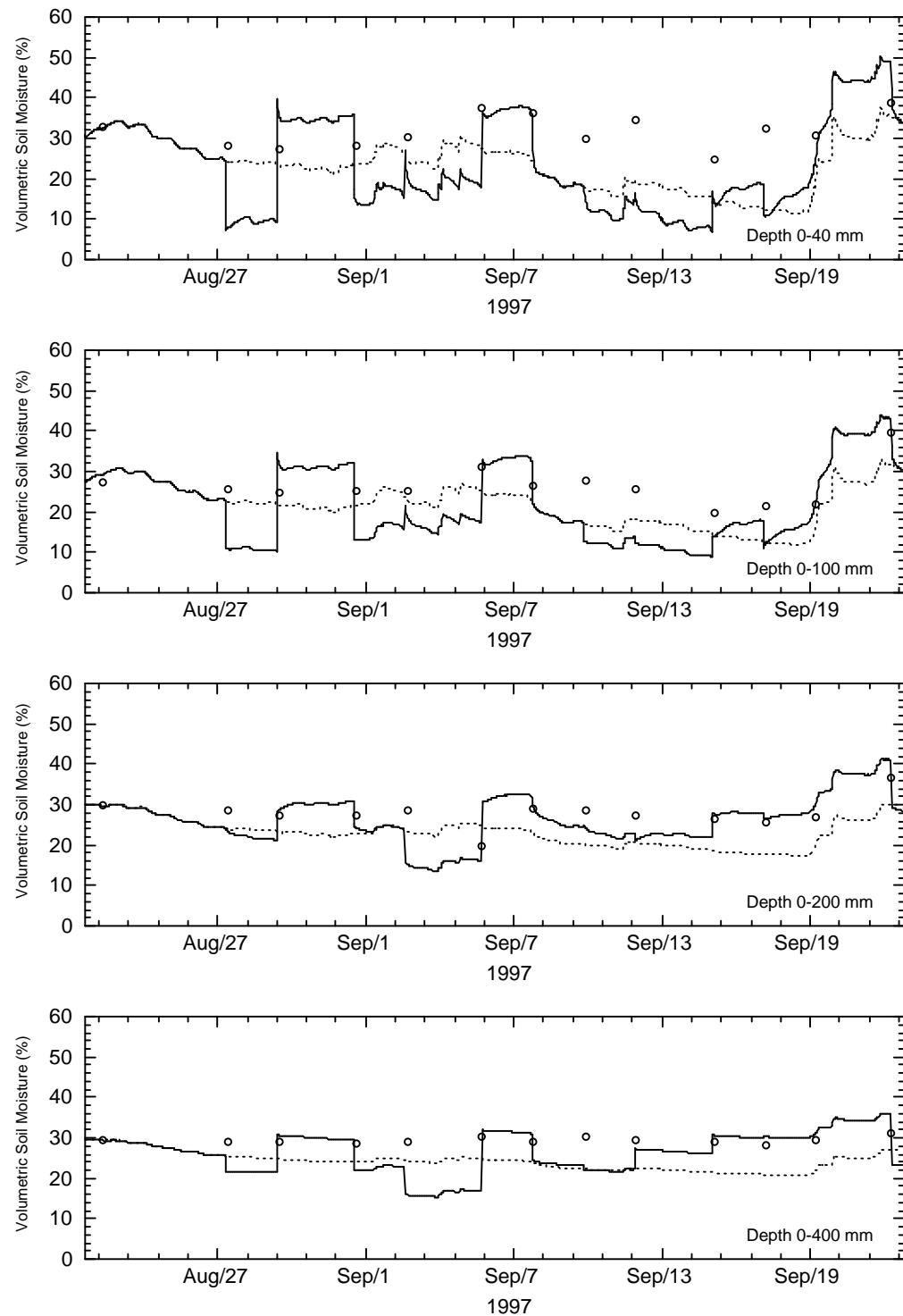


Figure F.36: Evaluation of soil moisture profile estimation at soil moisture profile number 10. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

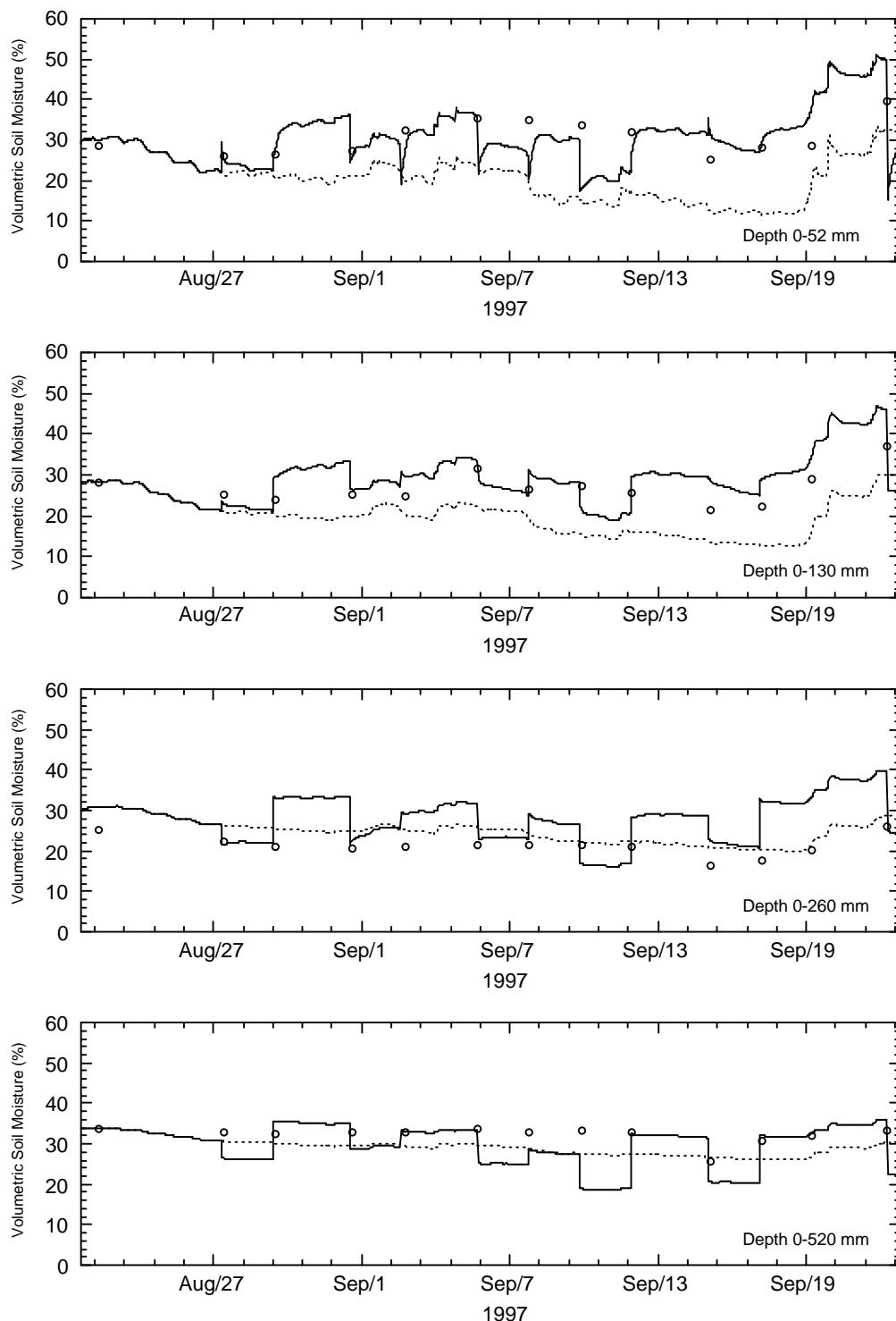


Figure F.37: Evaluation of soil moisture profile estimation at soil moisture profile number 11. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

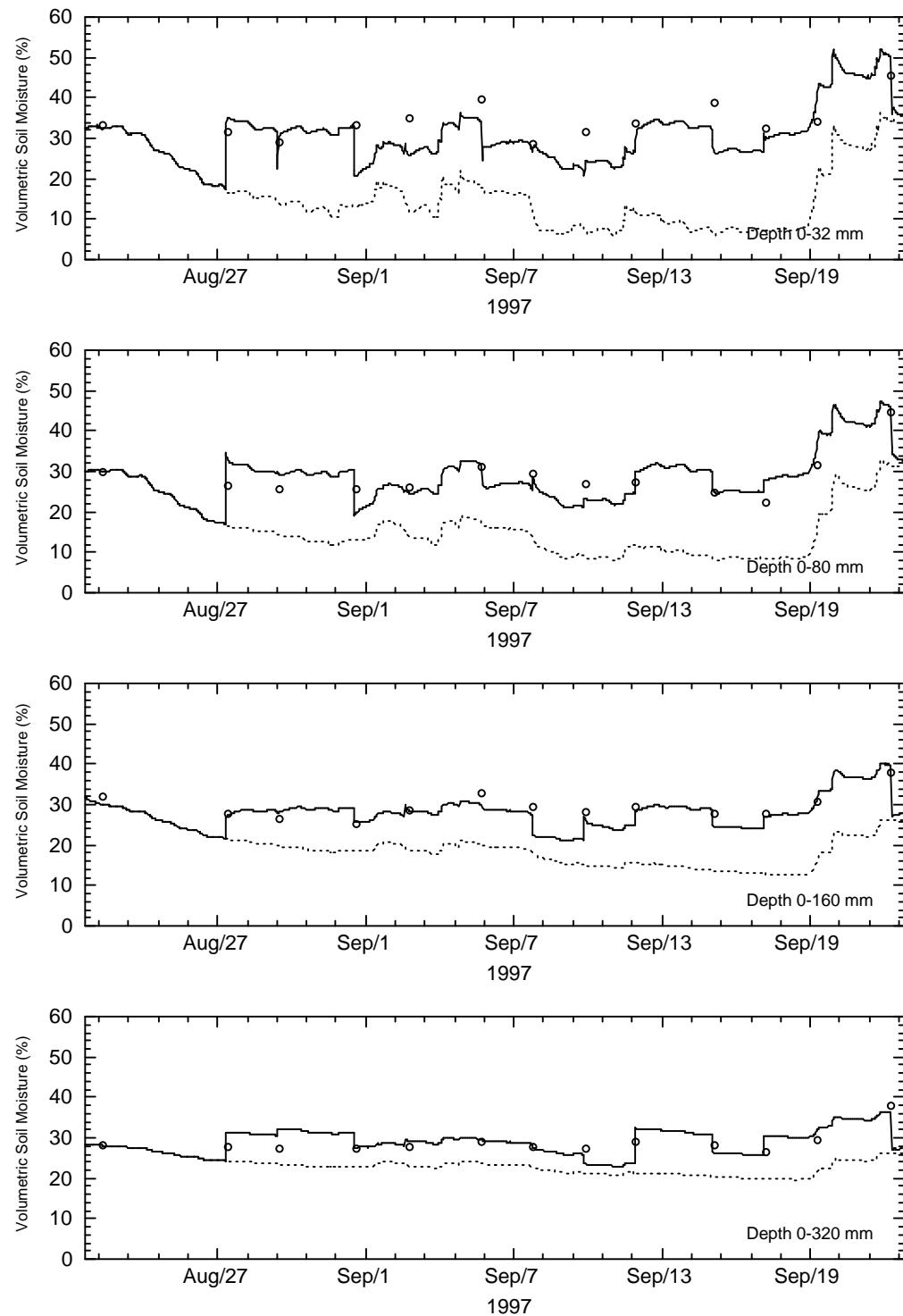


Figure F.38: Evaluation of soil moisture profile estimation at soil moisture profile number 12. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

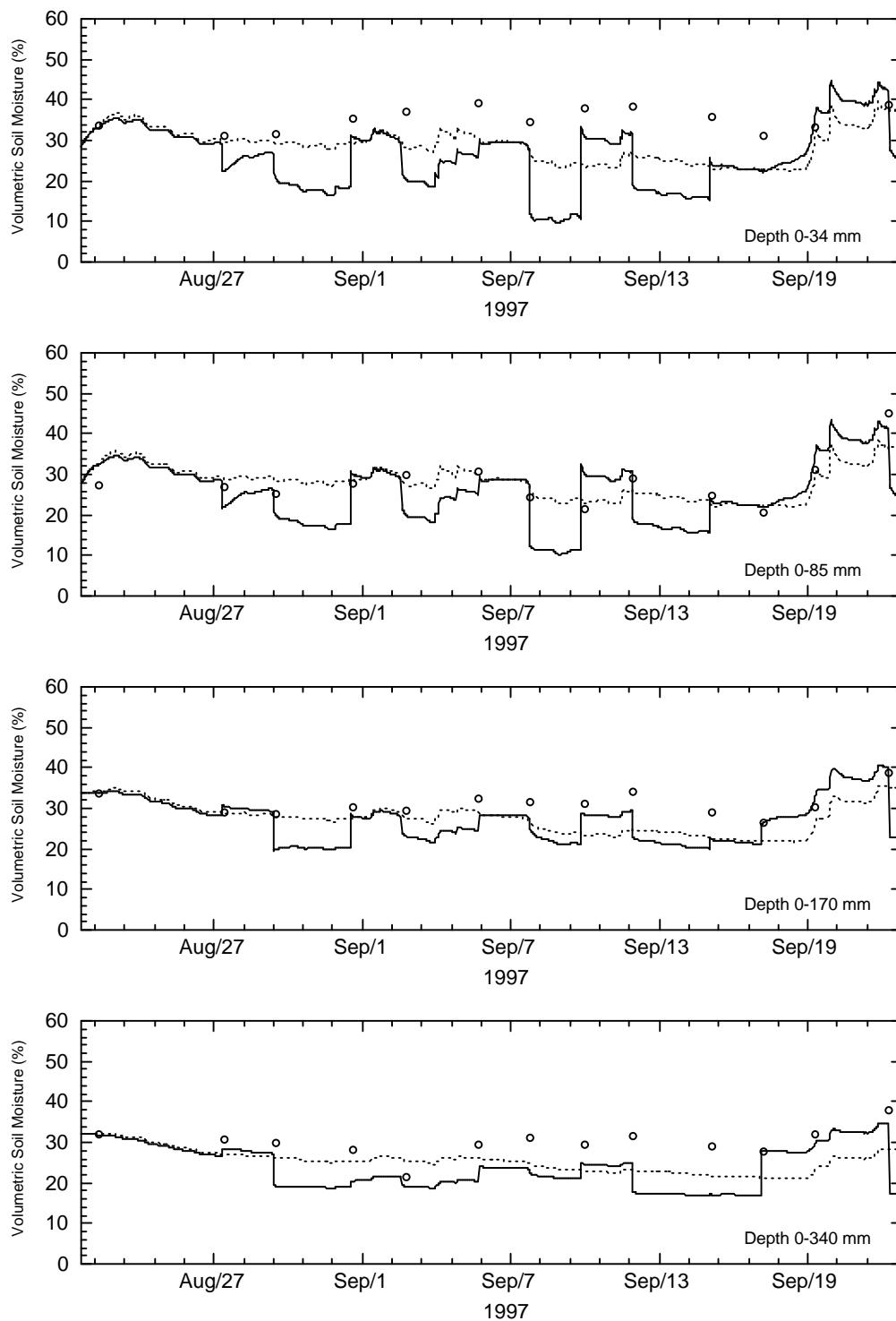


Figure F.39: Evaluation of soil moisture profile estimation at soil moisture profile number 13. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

F.3.2 COMPARISON OF PROFILE AND TDAS OBSERVATIONS

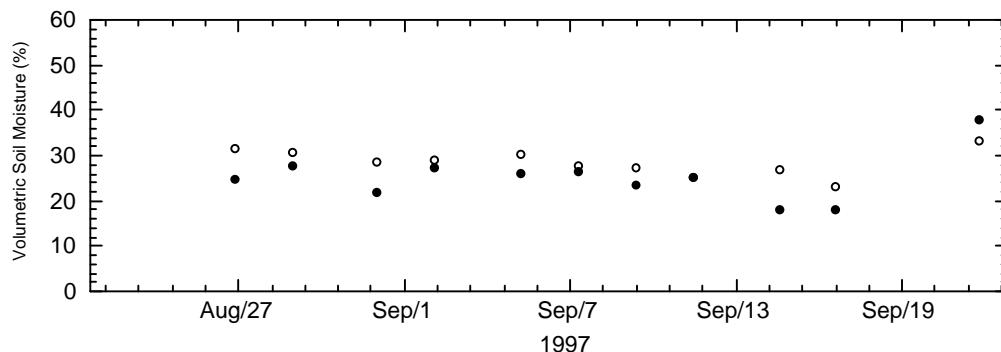


Figure F.40: Comparison of TDAS (solid symbol) and profile monitoring (open circle) 15 cm connector TDR soil moisture measurements for profile number 1.

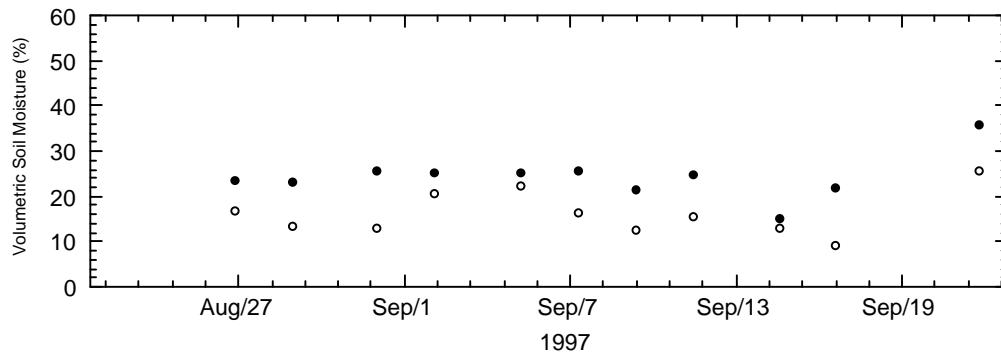


Figure F.41: Comparison of TDAS (solid symbol) and profile monitoring (open circle) 15 cm connector TDR soil moisture measurements for profile number 2.

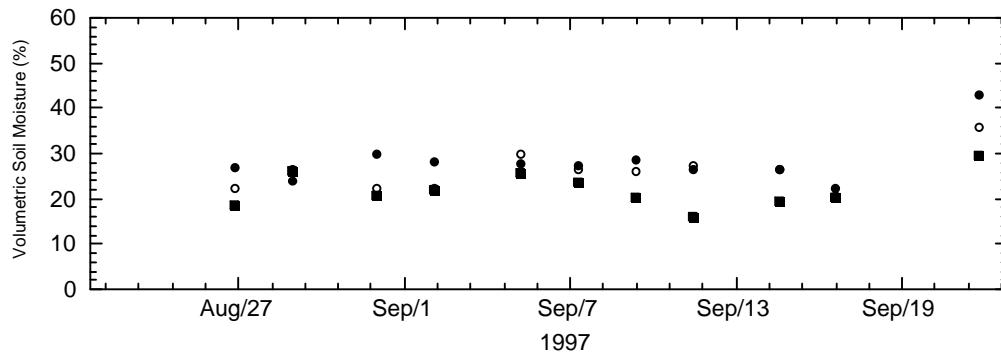


Figure F.42: Comparison of TDAS (solid symbol) and profile monitoring (open circle) 15 cm connector TDR soil moisture measurements for profile number 3.

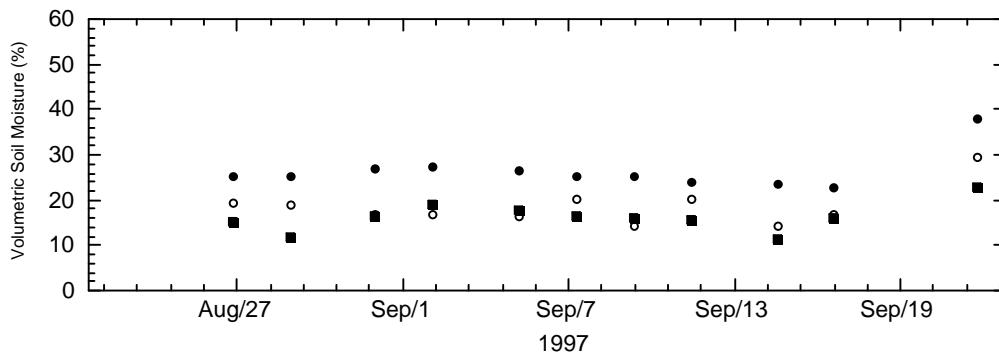


Figure F.43: Comparison of TDAS (solid symbol) and profile monitoring (open circle) 15 cm connector TDR soil moisture measurements for profile number 4.

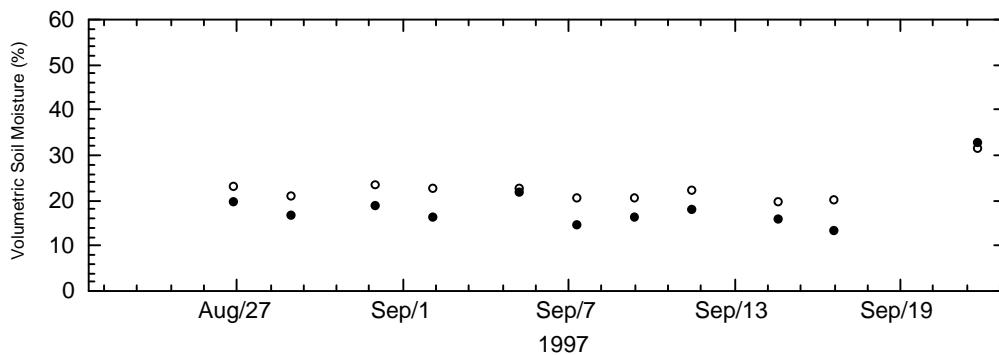


Figure F.44: Comparison of TDAS (solid symbol) and profile monitoring (open circle) 15 cm connector TDR soil moisture measurements for profile number 5.

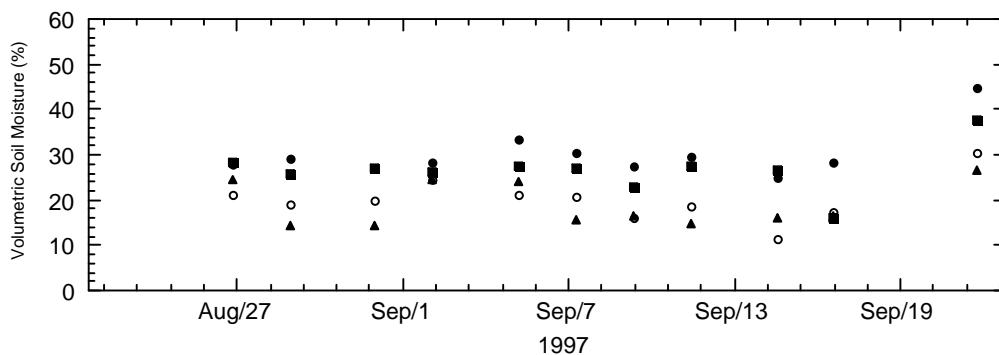


Figure F.45: Comparison of TDAS (solid symbol) and profile monitoring (open circle) 15 cm connector TDR soil moisture measurements for profile number 6.

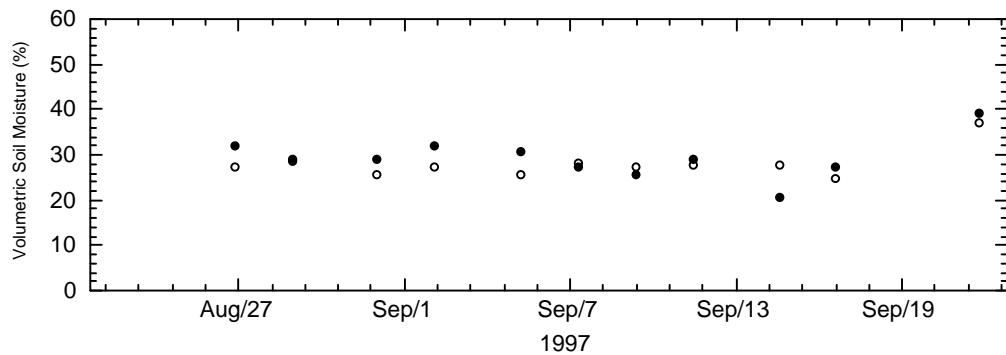


Figure F.46: Comparison of TDAS (solid symbol) and profile monitoring (open circle) 15 cm connector TDR soil moisture measurements for profile number 7.

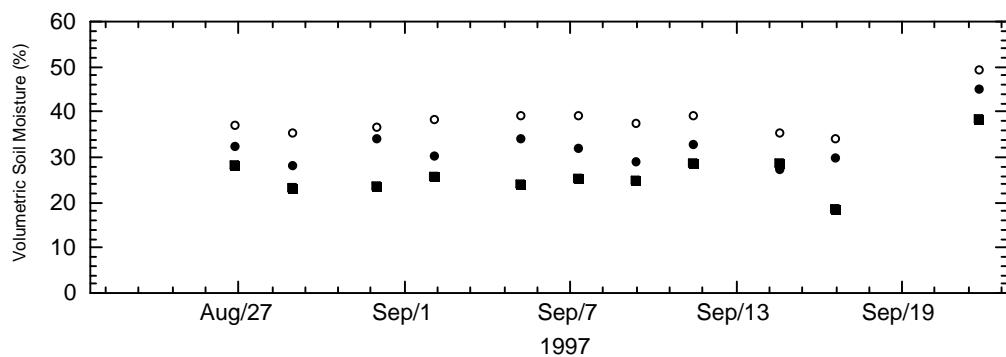


Figure F.47: Comparison of TDAS (solid symbol) and profile monitoring (open circle) 15 cm connector TDR soil moisture measurements for profile number 8.

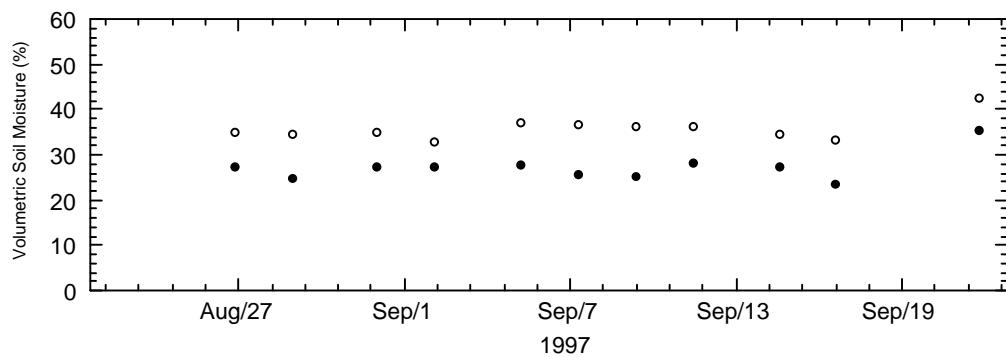


Figure F.48: Comparison of TDAS (solid symbol) and profile monitoring (open circle) 15 cm connector TDR soil moisture measurements for profile number 9.

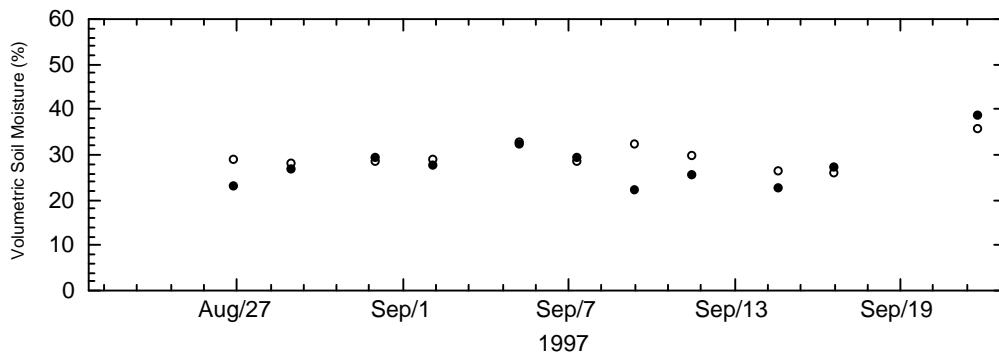


Figure F.49: Comparison of TDAS (solid symbol) and profile monitoring (open circle) 15 cm connector TDR soil moisture measurements for profile number 10.

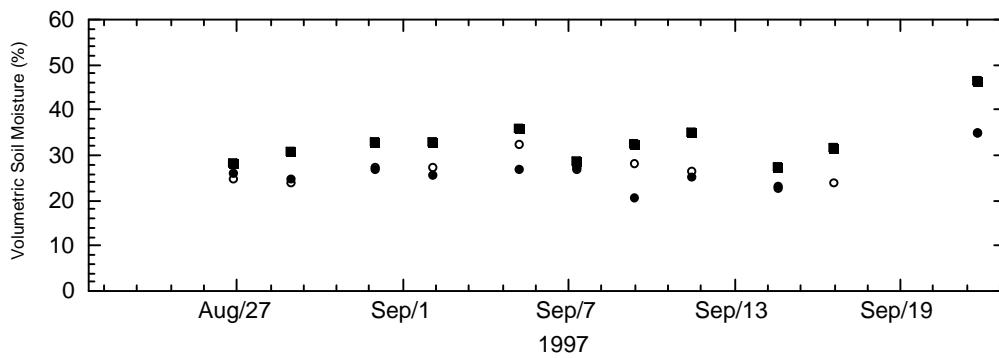


Figure F.50: Comparison of TDAS (solid symbol) and profile monitoring (open circle) 15 cm connector TDR soil moisture measurements for profile number 11.

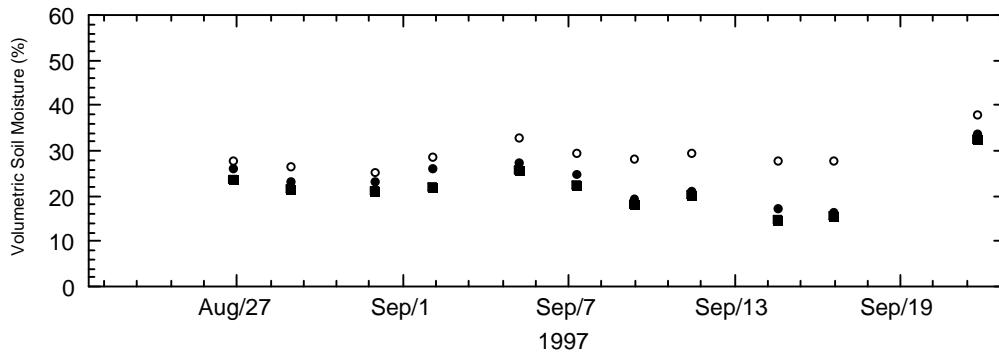


Figure F.51: Comparison of TDAS (solid symbol) and profile monitoring (open circle) 15 cm connector TDR soil moisture measurements for profile number 12.

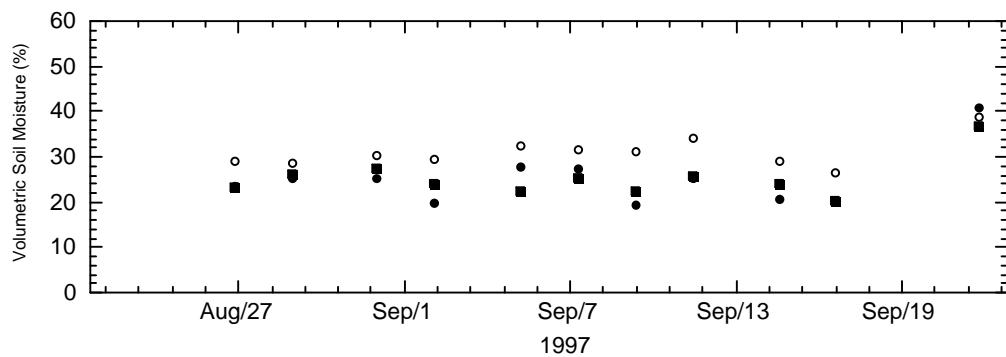


Figure F.52: Comparison of TDAS (solid symbol) and profile monitoring (open circle) 15 cm connector TDR soil moisture measurements for profile number 13.

F.3.3 UPDATING WITH MODIFIED TDAS OBSERVATIONS

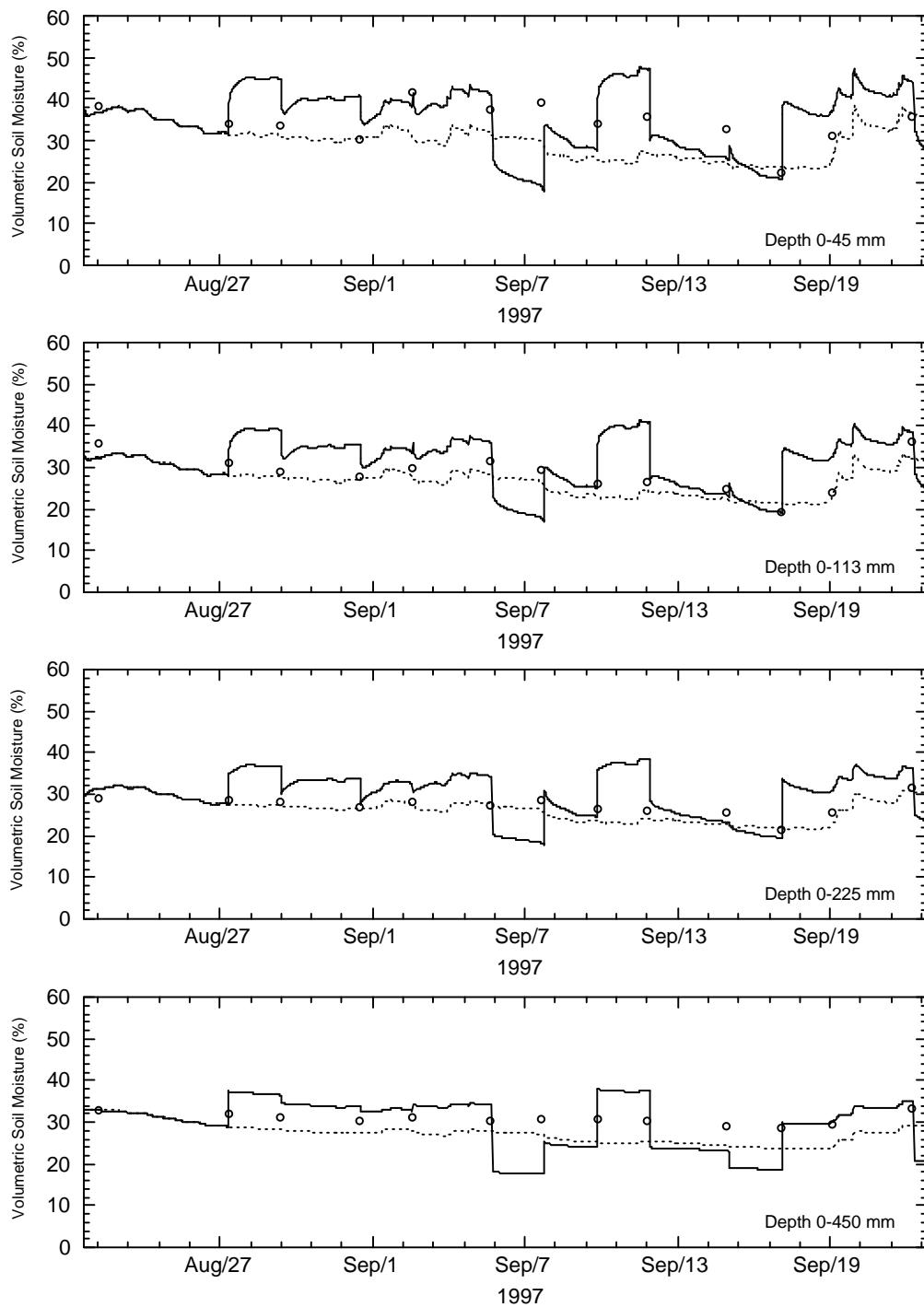


Figure F.53: Evaluation of soil moisture profile estimation at soil moisture profile number 1. Connector TDR observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

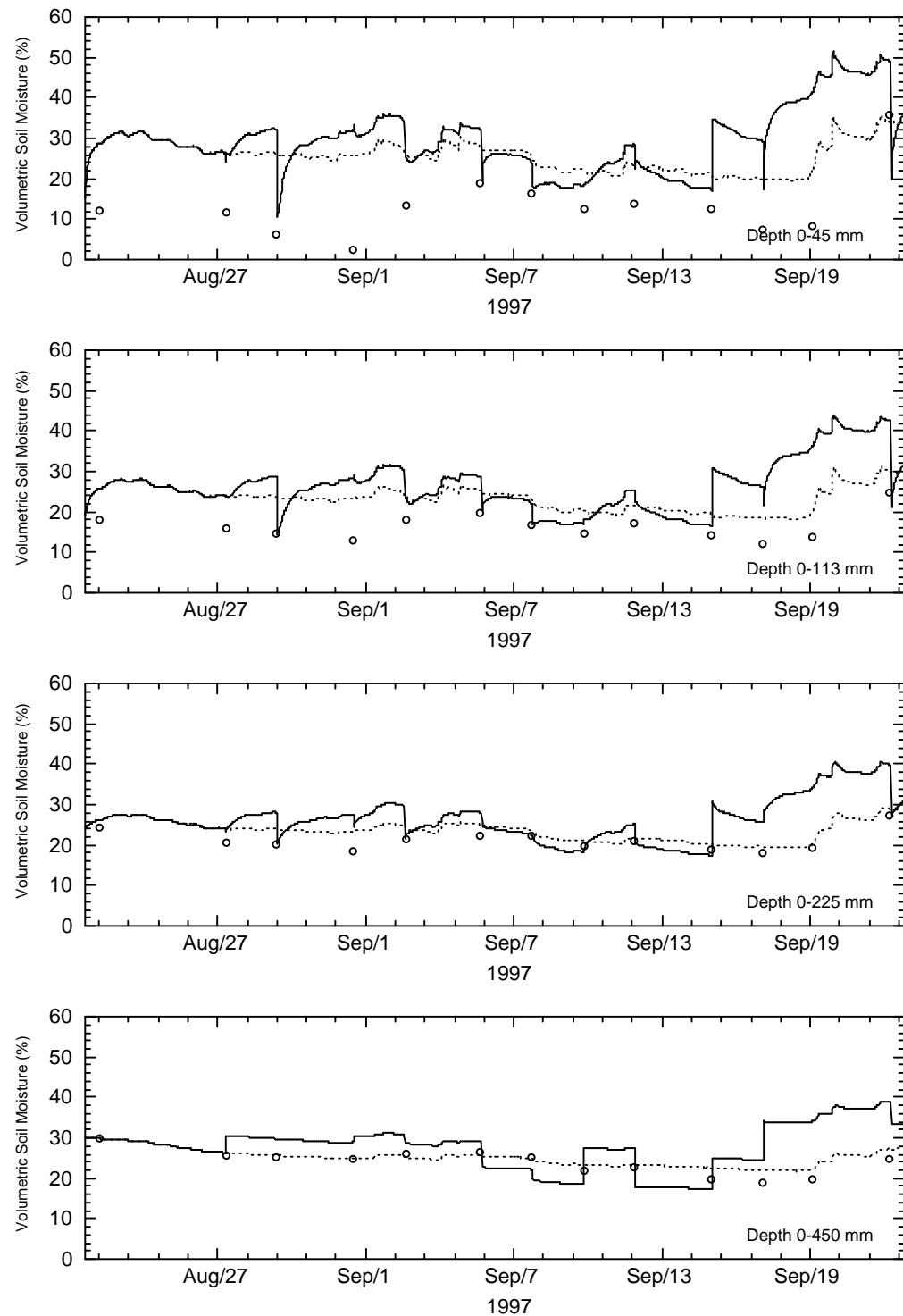


Figure F.54: Evaluation of soil moisture profile estimation at soil moisture profile number 2. Connector TDR observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

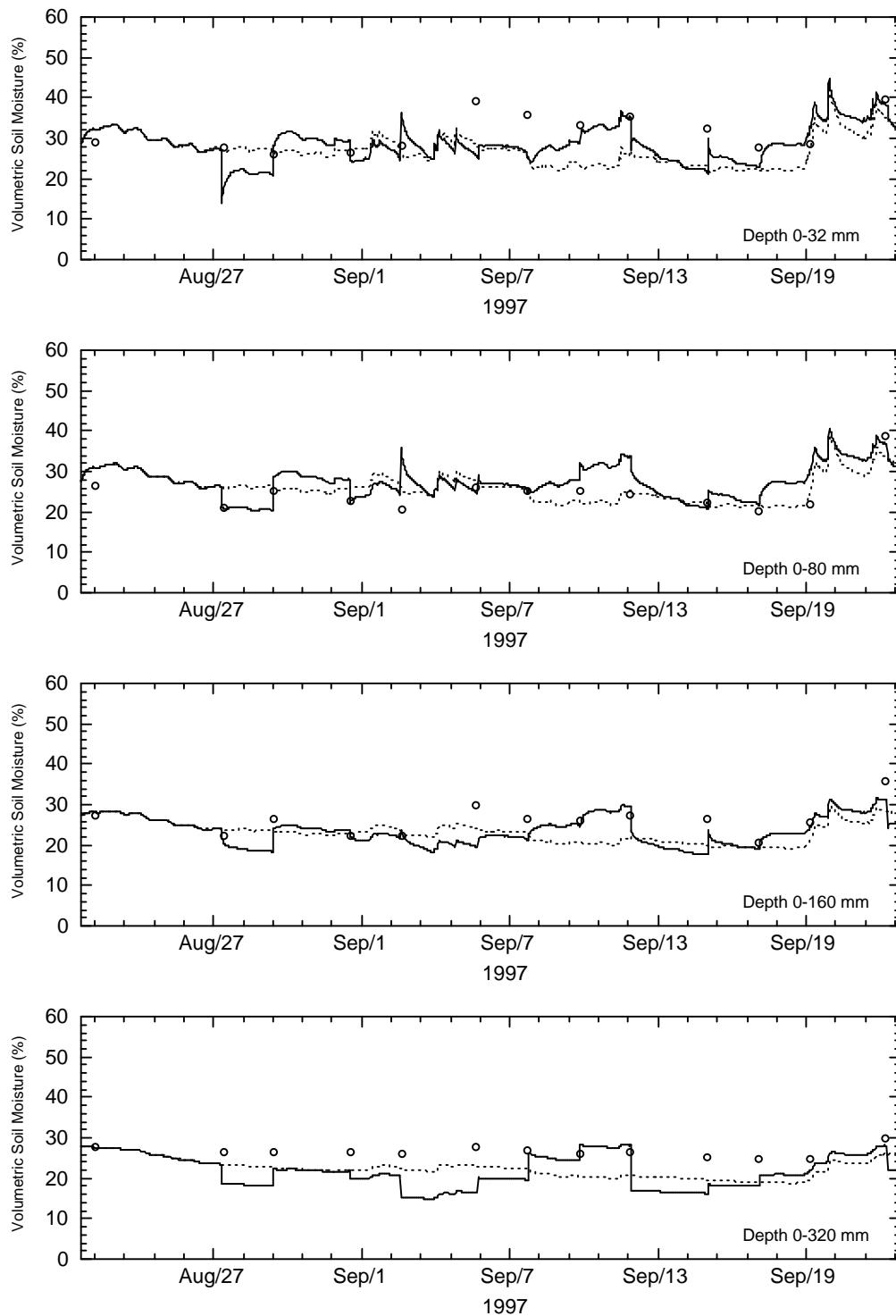


Figure F.55: Evaluation of soil moisture profile estimation at soil moisture profile number 3. Connector TDR observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

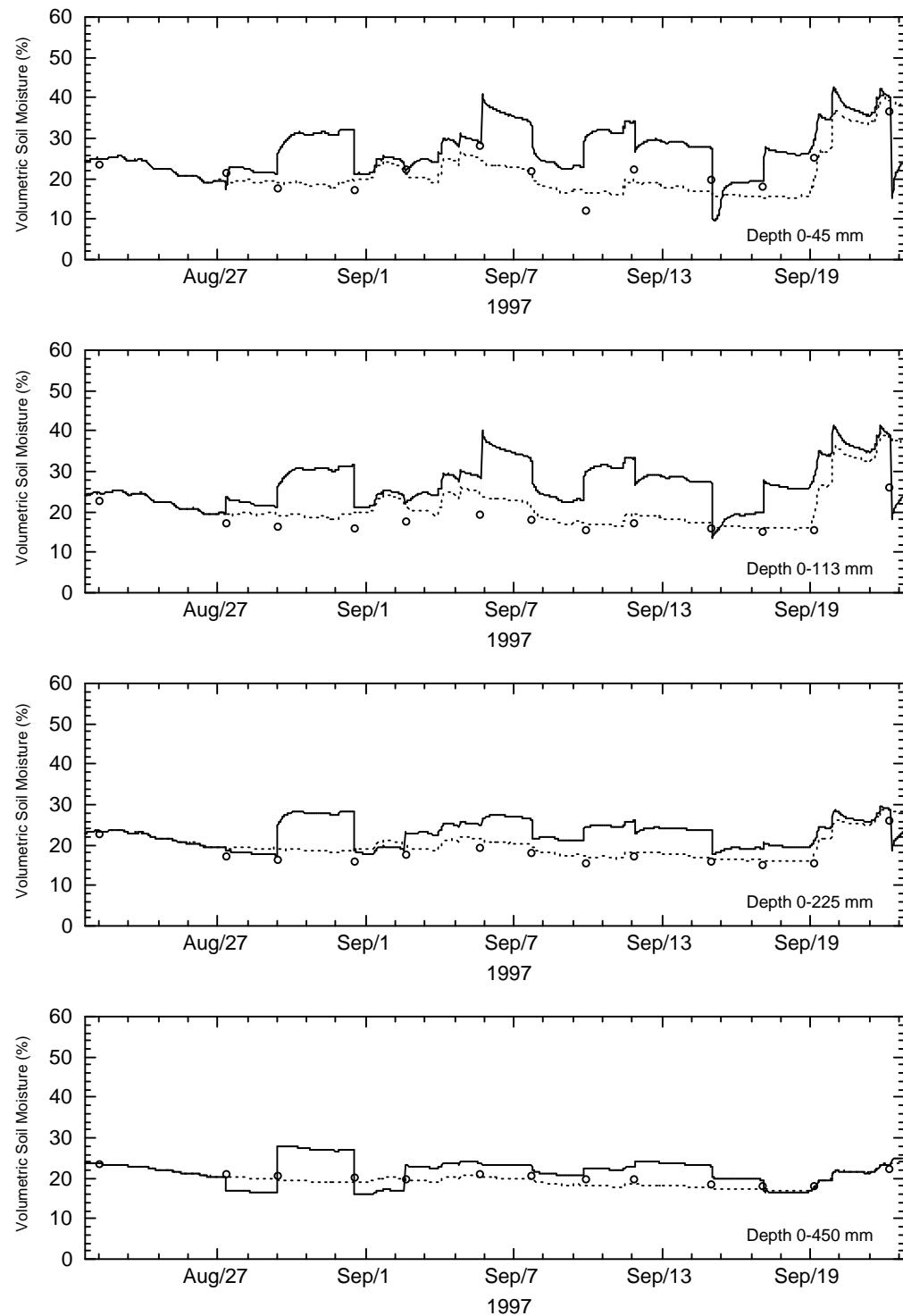


Figure F.56: Evaluation of soil moisture profile estimation at soil moisture profile number 4. Connector TDR observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

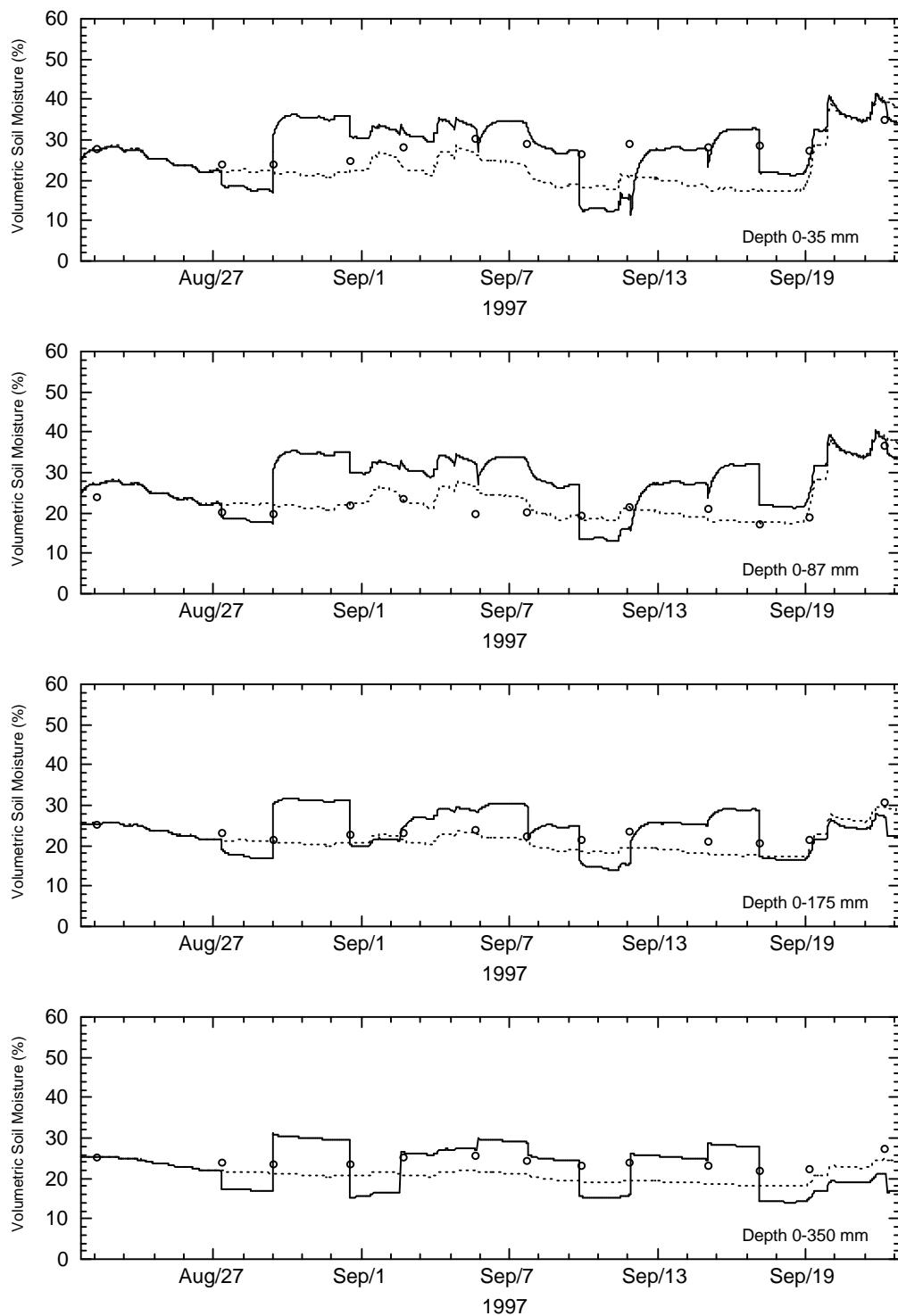


Figure F.57: Evaluation of soil moisture profile estimation at soil moisture profile number 5. Connector TDR observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

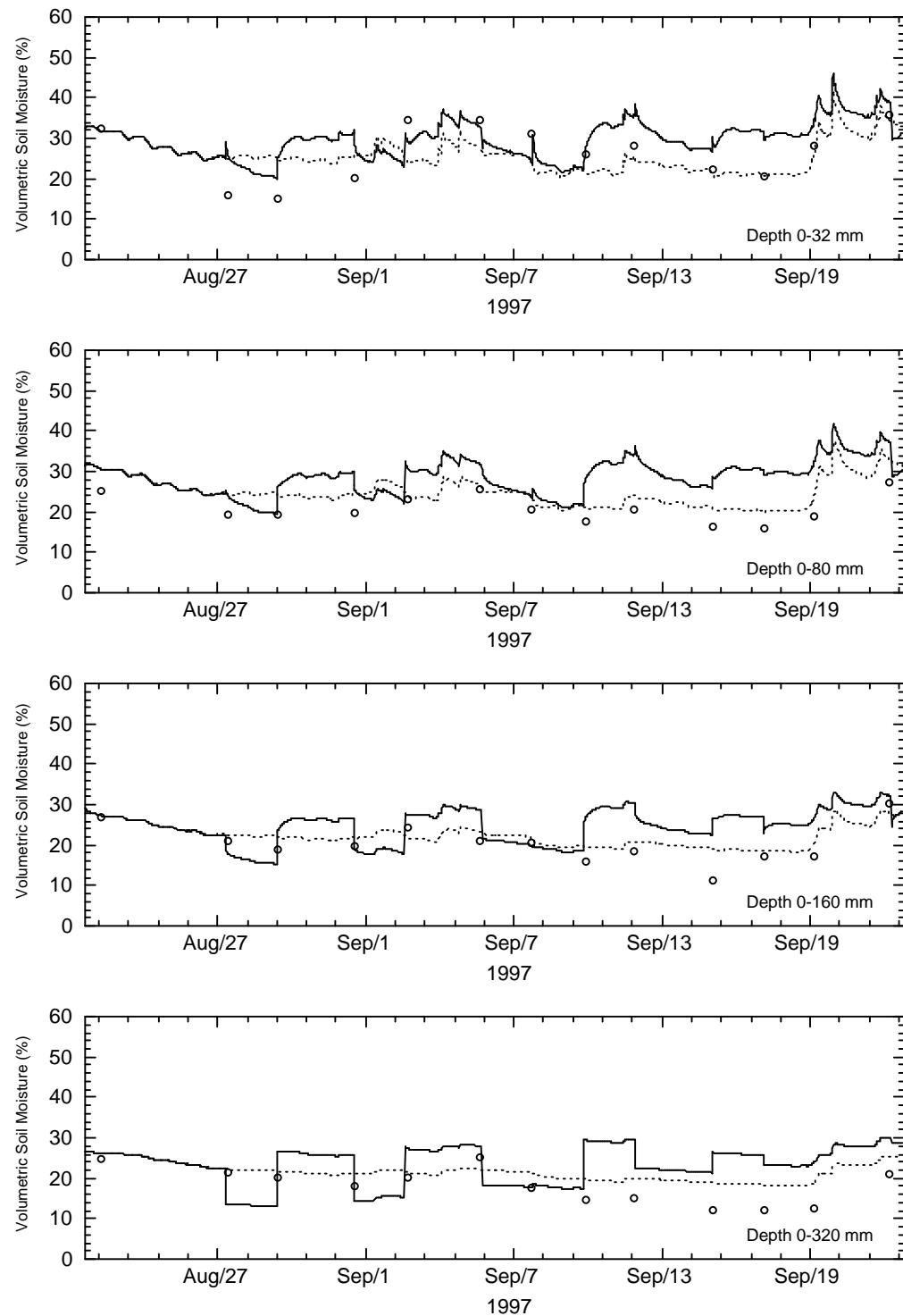


Figure F.58: Evaluation of soil moisture profile estimation at soil moisture profile number 6. Connector TDR observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

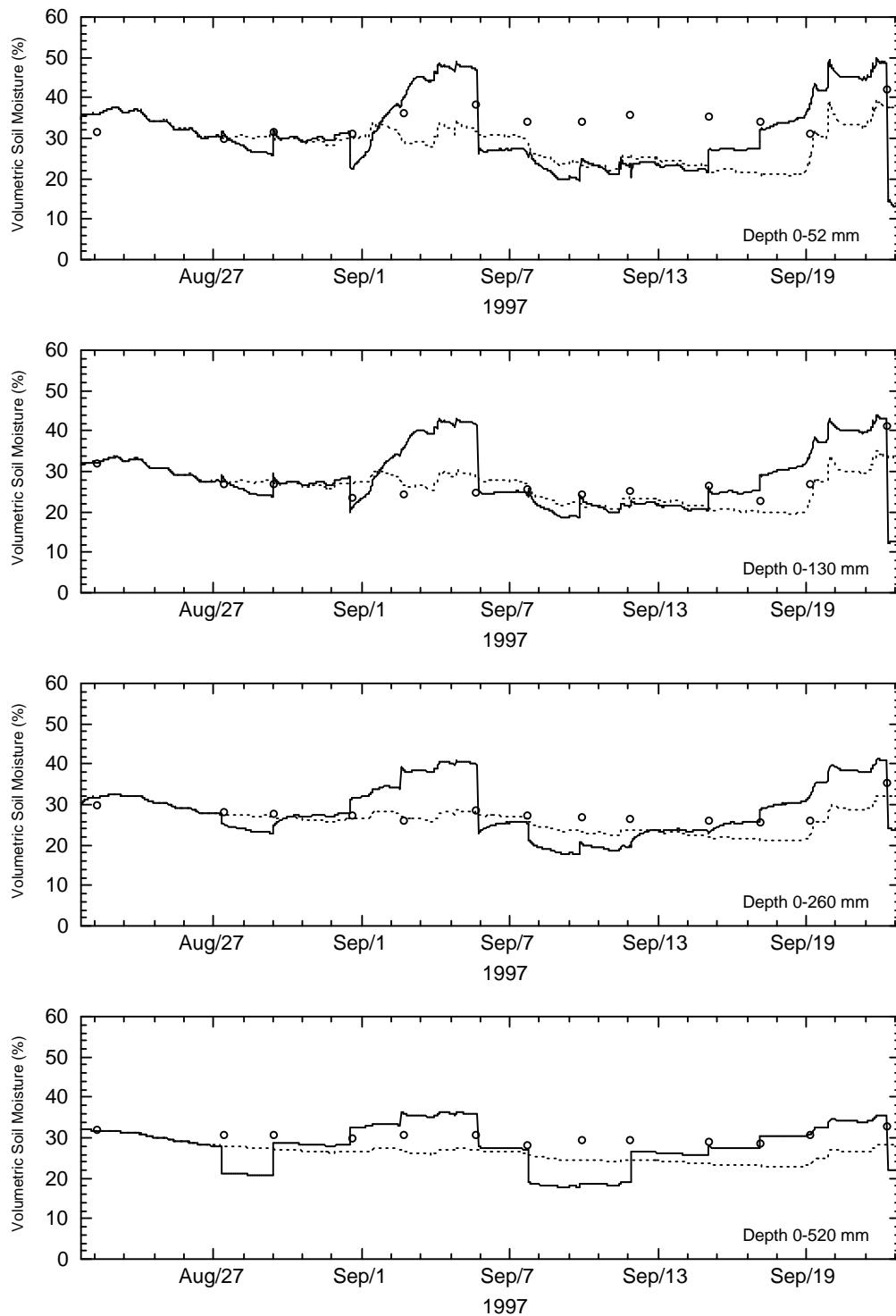


Figure F.59: Evaluation of soil moisture profile estimation at soil moisture profile number 7. Connector TDR observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

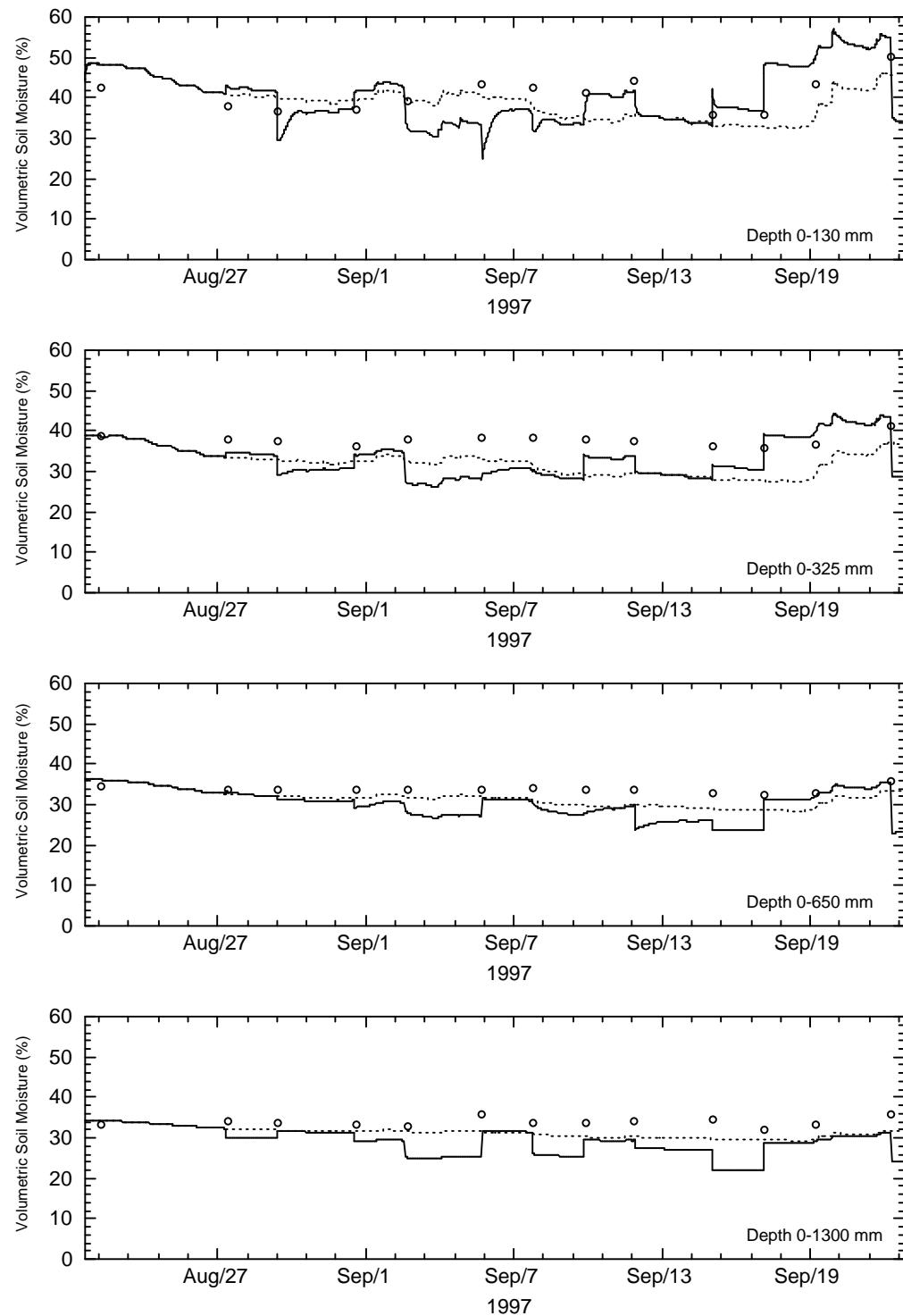


Figure F.60: Evaluation of soil moisture profile estimation at soil moisture profile number 8. Connector TDR observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

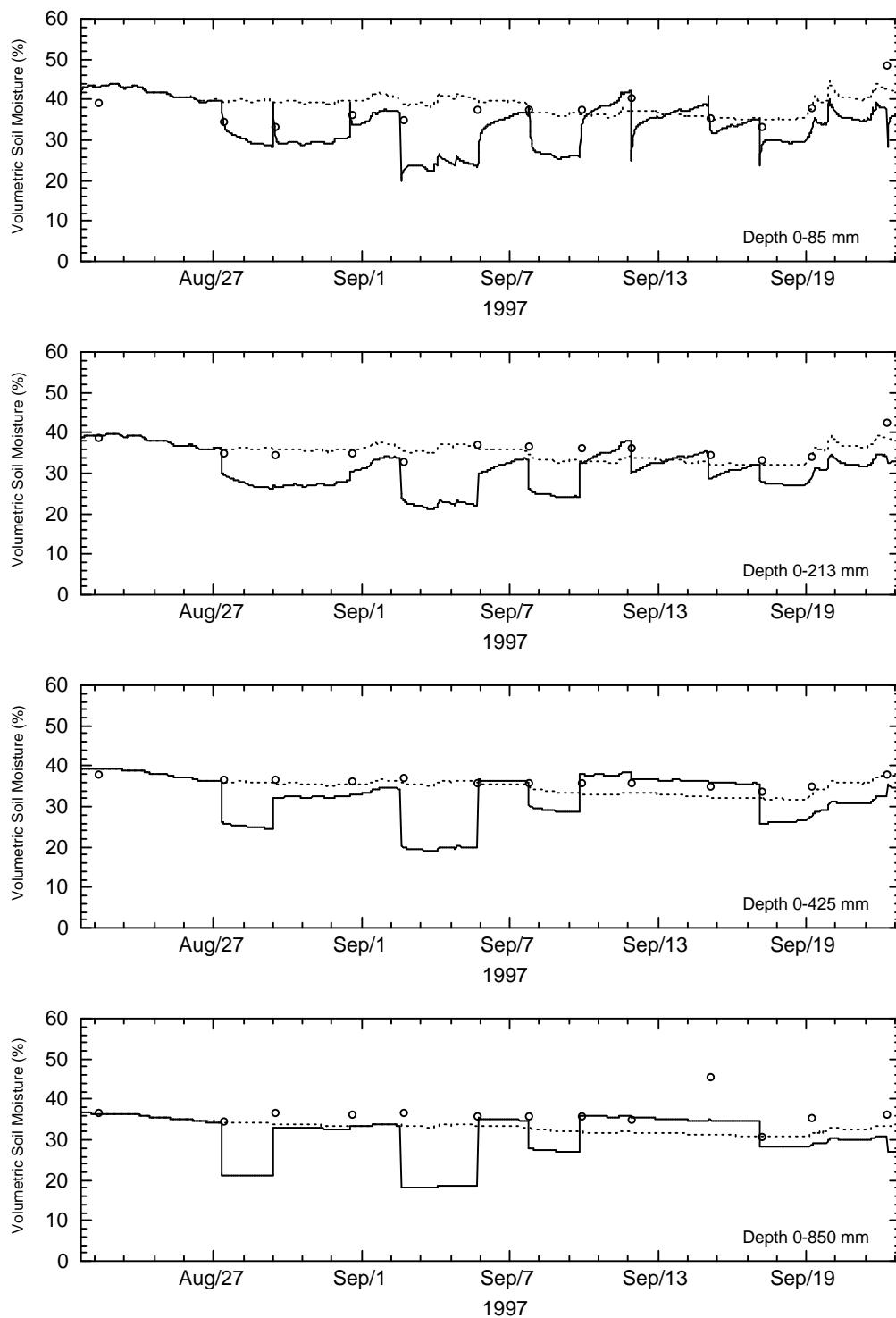


Figure F.61: Evaluation of soil moisture profile estimation at soil moisture profile number 9. Connector TDR observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

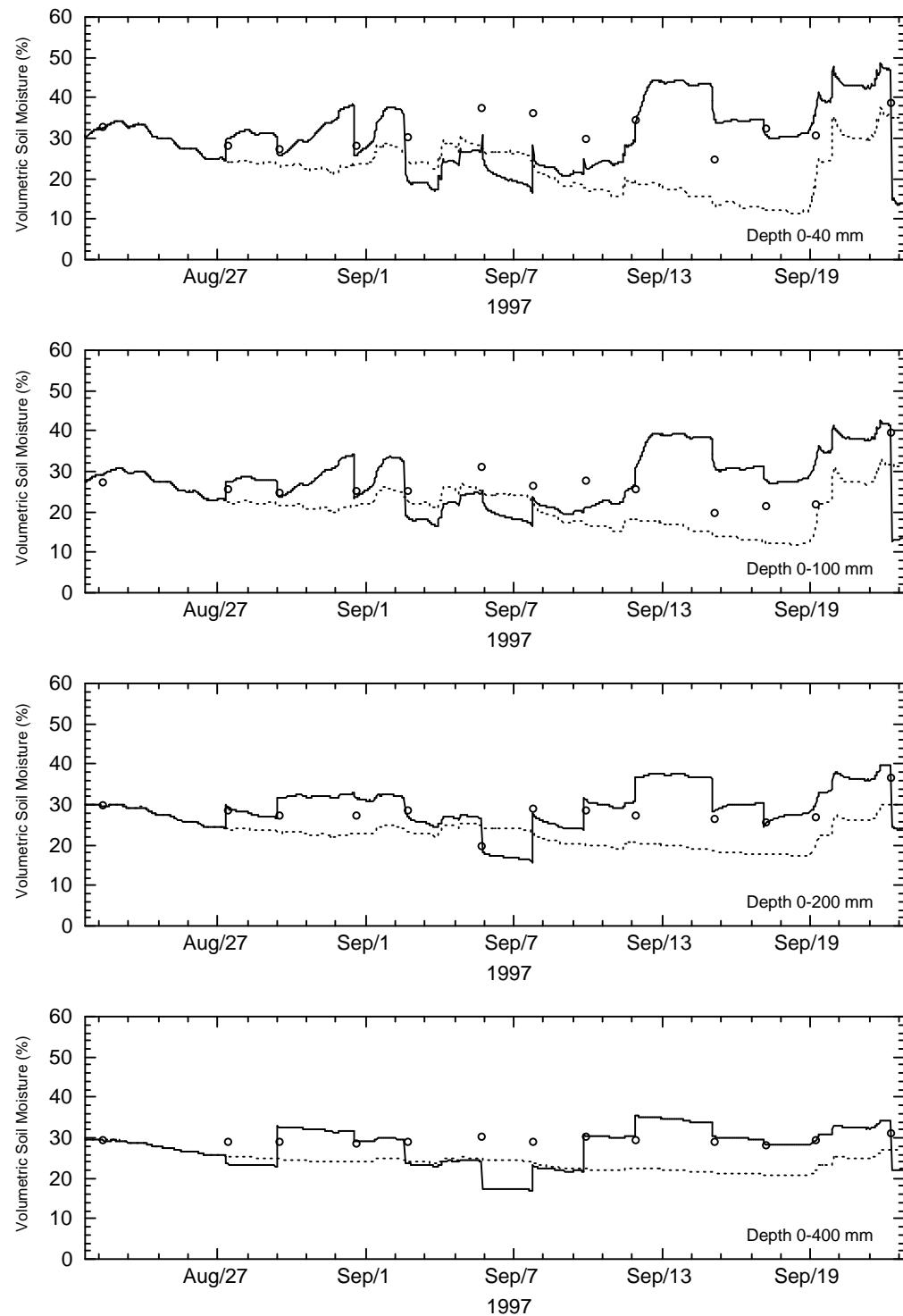


Figure F.62: Evaluation of soil moisture profile estimation at soil moisture profile number 10. Connector TDR observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

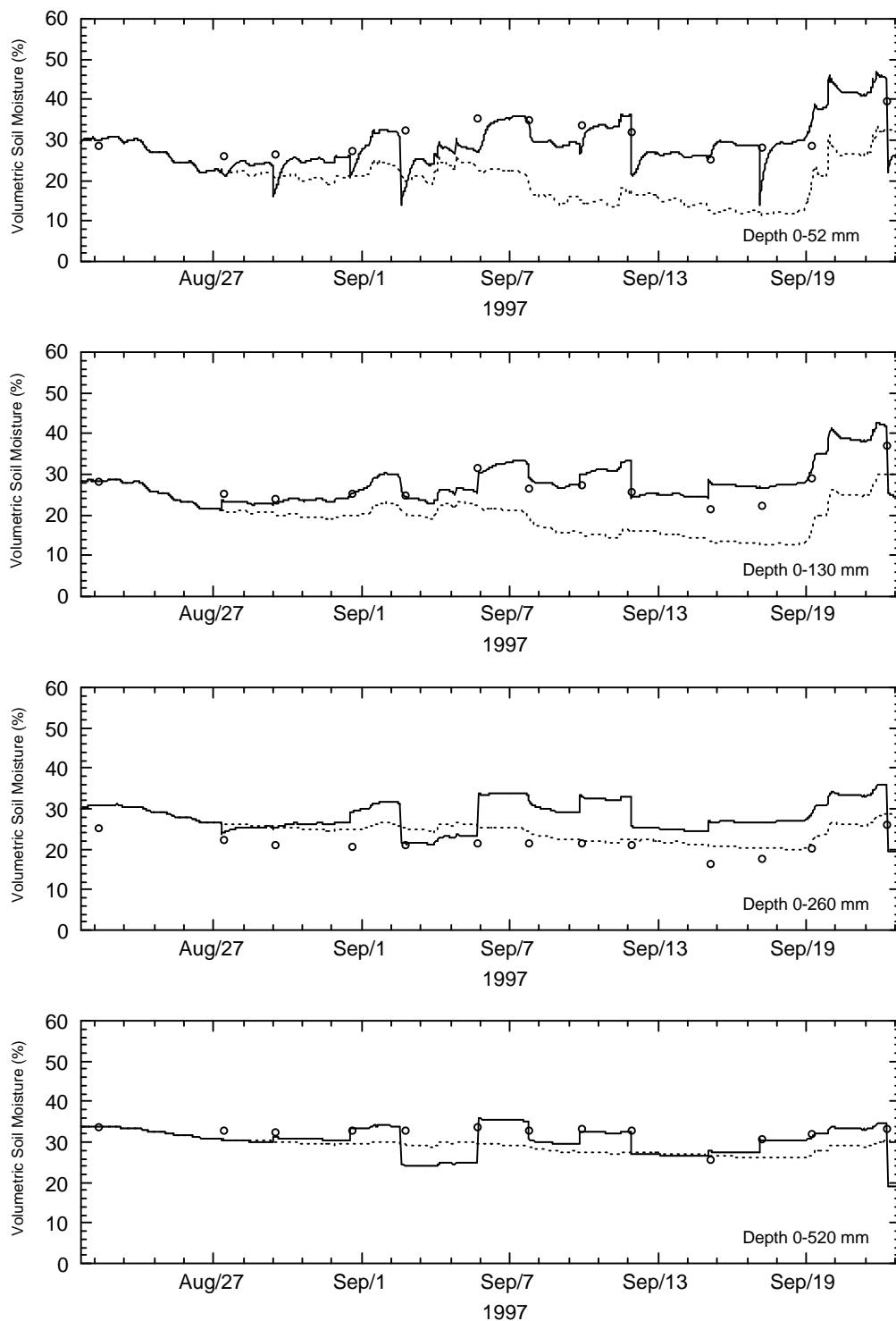


Figure F.63: Evaluation of soil moisture profile estimation at soil moisture profile number 11. Connector TDR observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

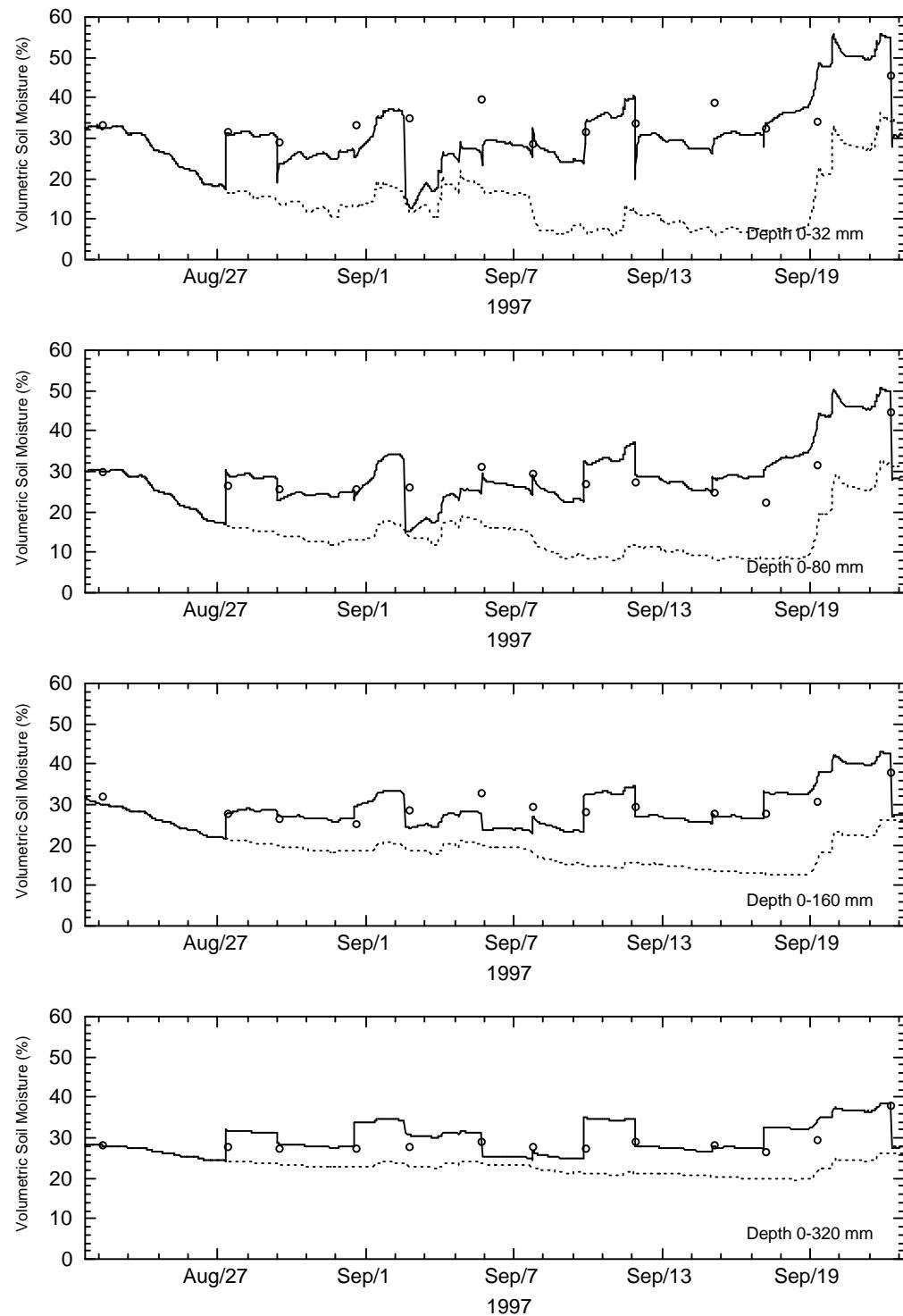


Figure F.64: Evaluation of soil moisture profile estimation at soil moisture profile number 12. Connector TDR observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

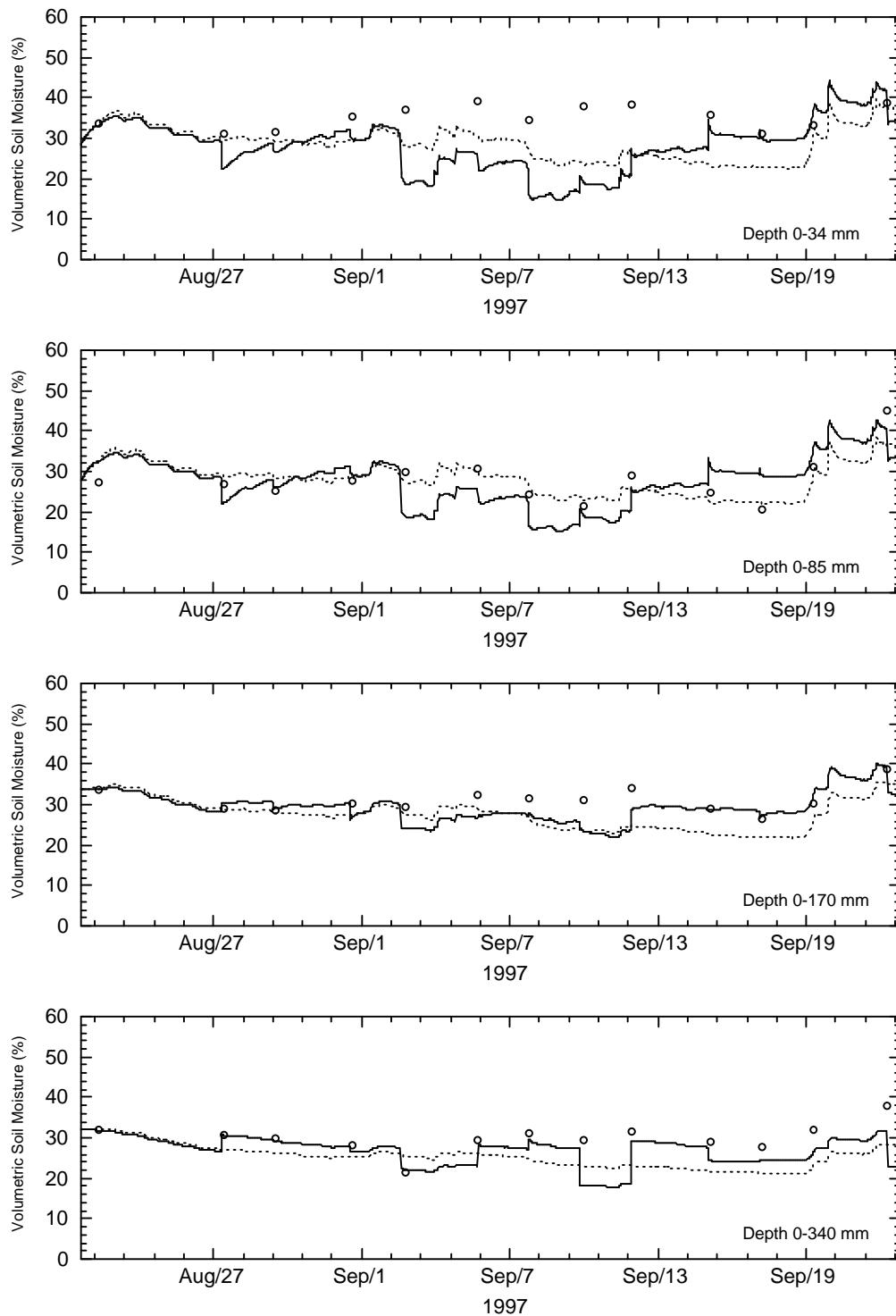


Figure F.65: Evaluation of soil moisture profile estimation at soil moisture profile number 13. Connector TDR observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with the observed soil moisture content.

F.3.4 INITIALISATION USING A POOR GUESS

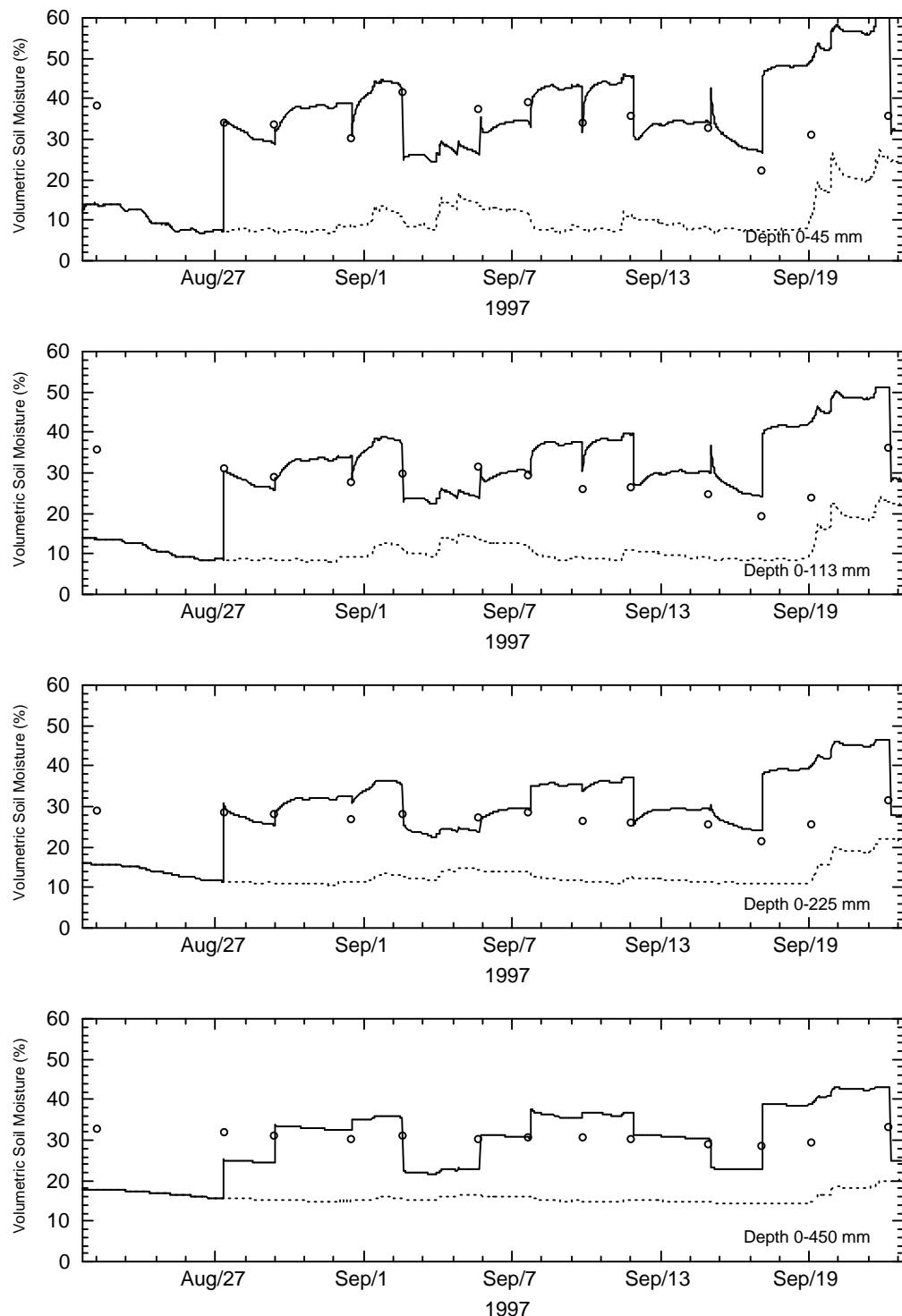


Figure F.66: Evaluation of soil moisture profile estimation at soil moisture profile number 1. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of soil moisture content.

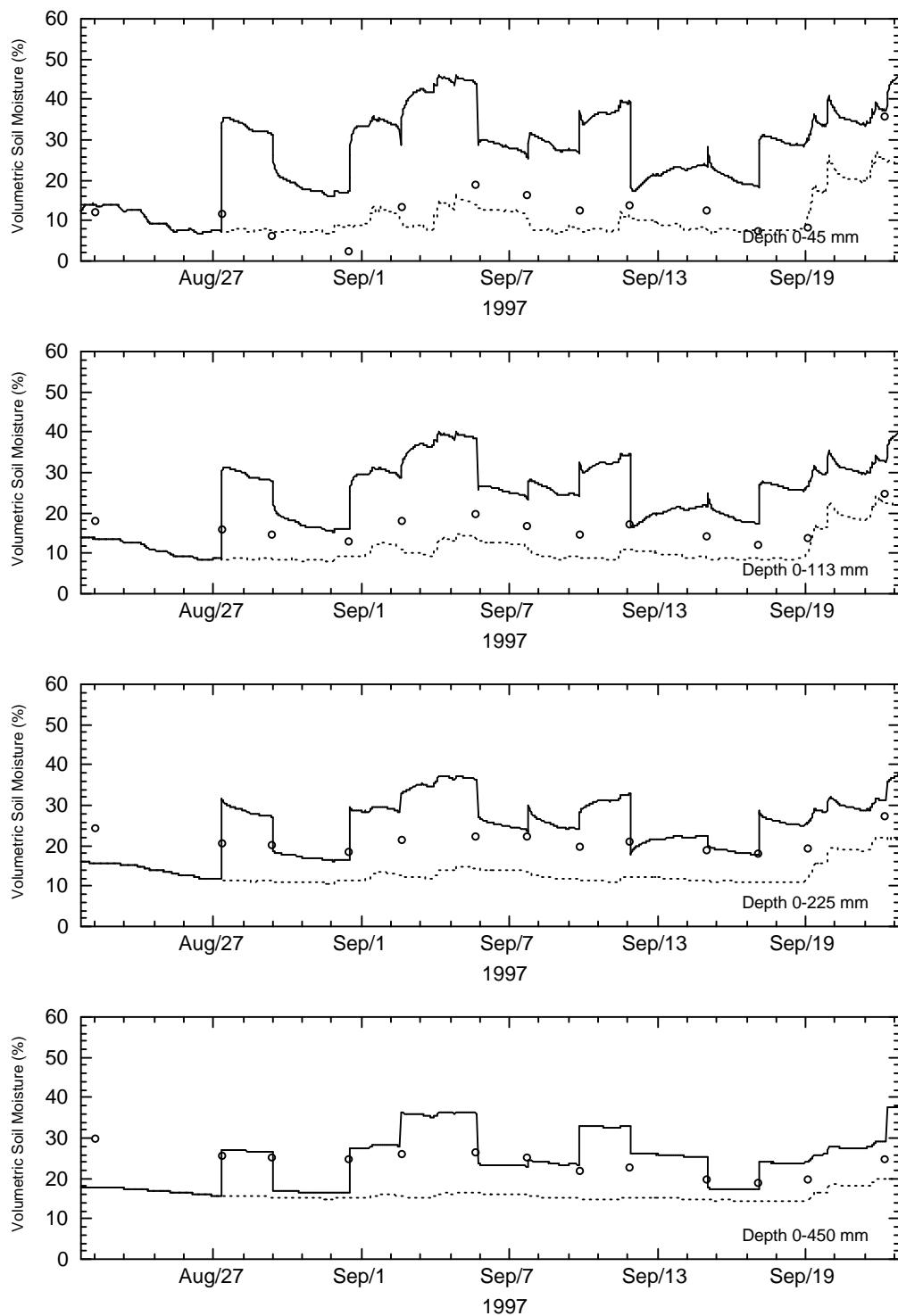


Figure F.67: Evaluation of soil moisture profile estimation at soil moisture profile number 2. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of soil moisture content.

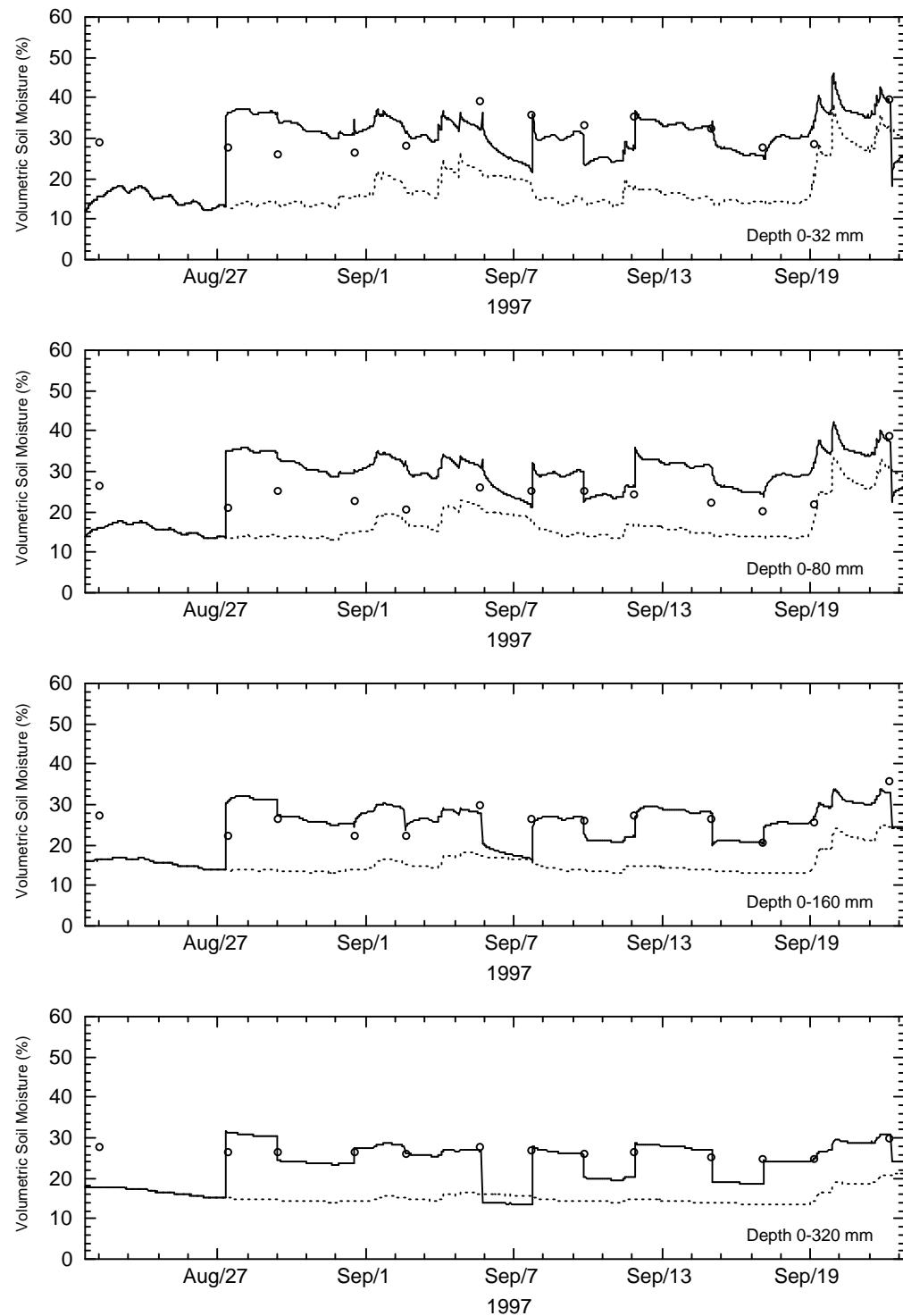


Figure F.68: Evaluation of soil moisture profile estimation at soil moisture profile number 3. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of soil moisture content.

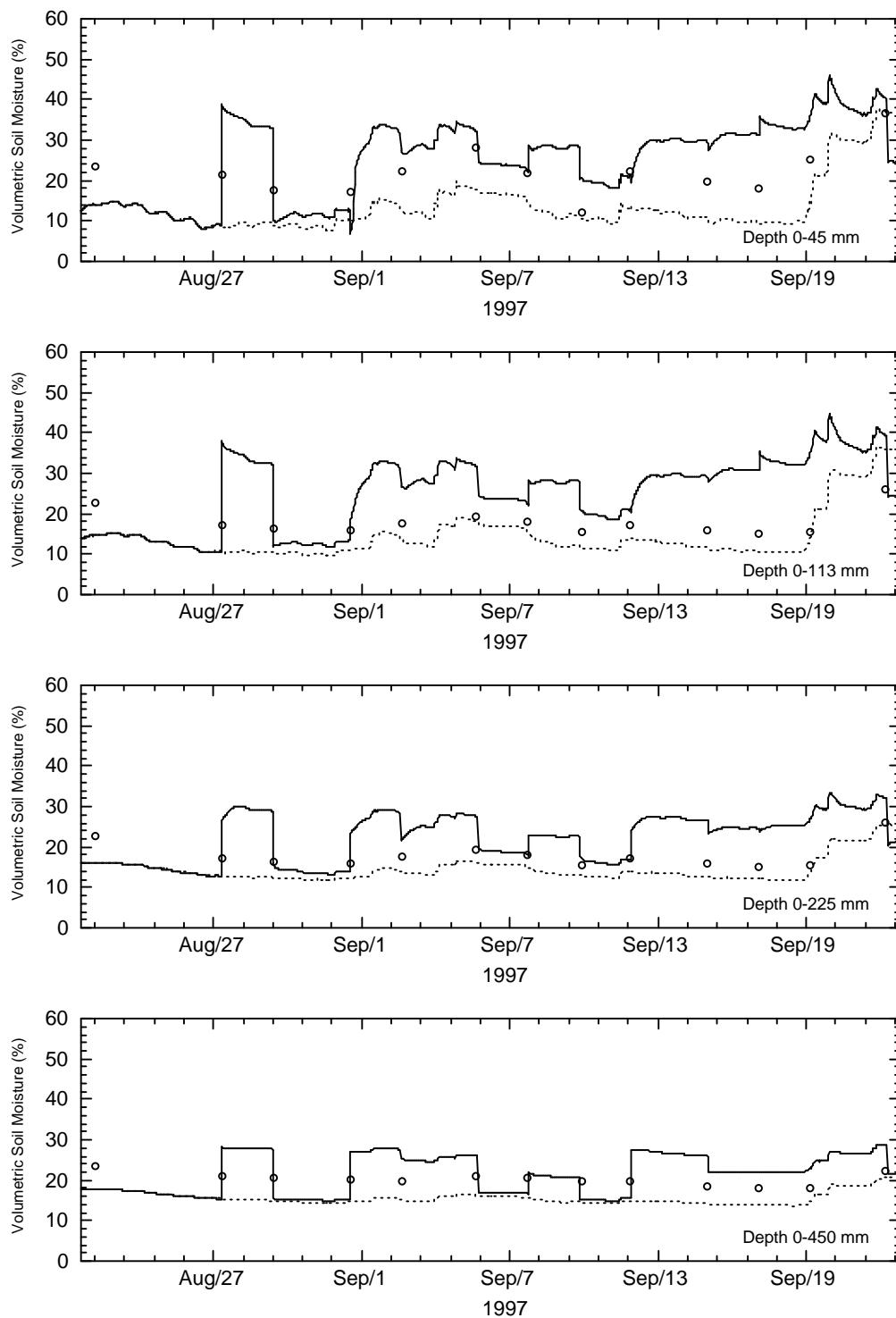


Figure F.69: Evaluation of soil moisture profile estimation at soil moisture profile number 4. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of soil moisture content.

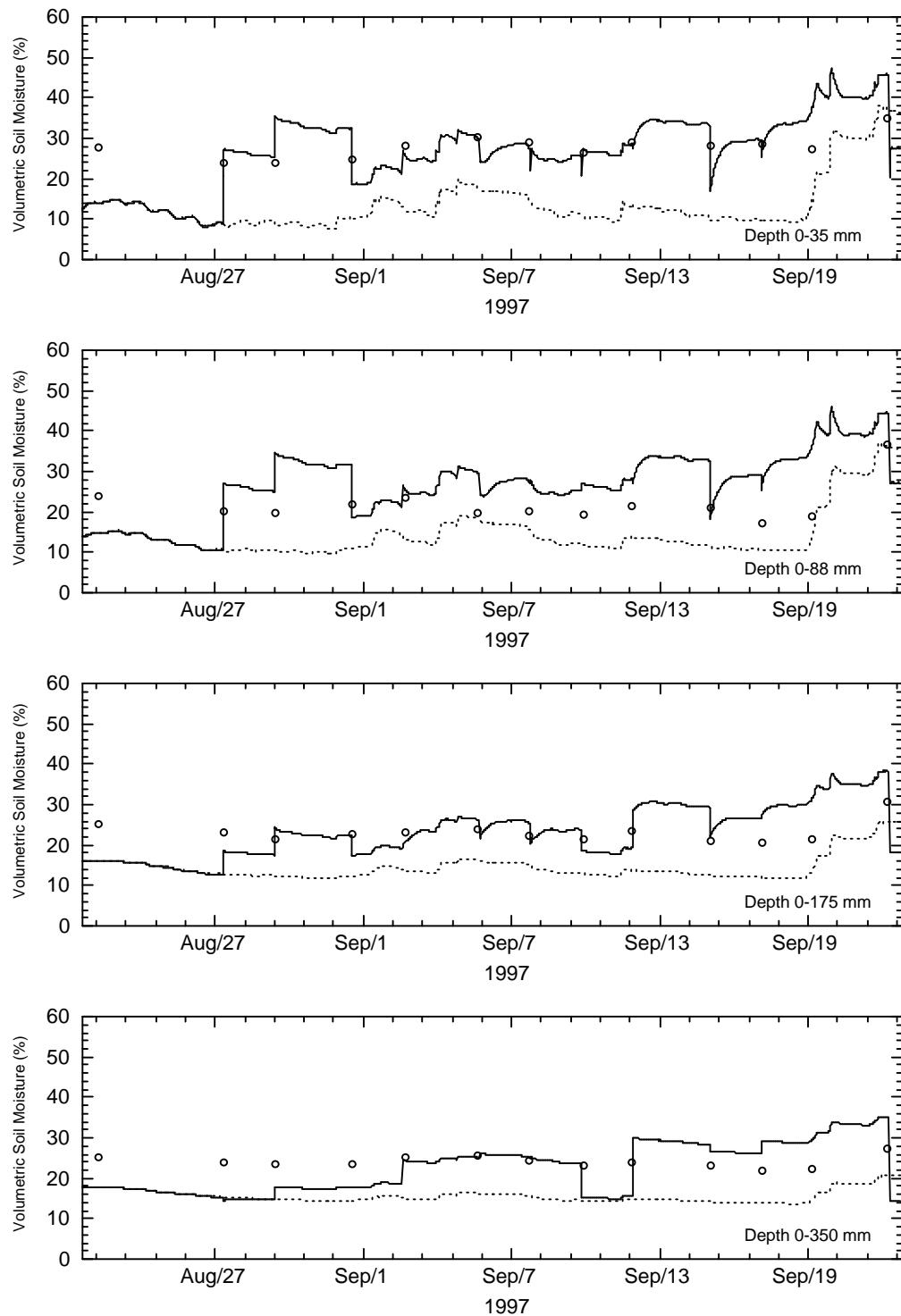


Figure F.70: Evaluation of soil moisture profile estimation at soil moisture profile number 5. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of soil moisture content.

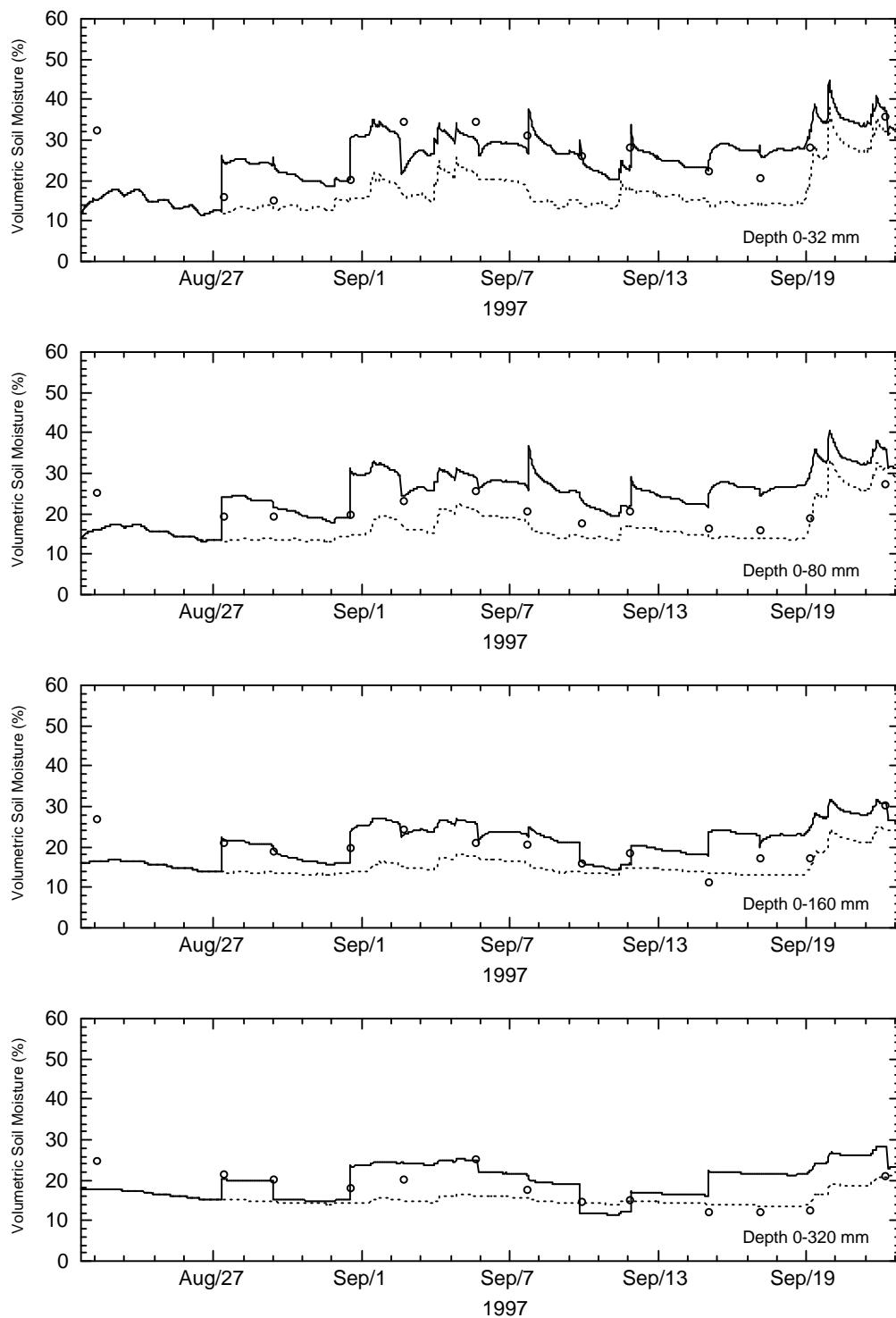


Figure F.71: Evaluation of soil moisture profile estimation at soil moisture profile number 6. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of soil moisture content.

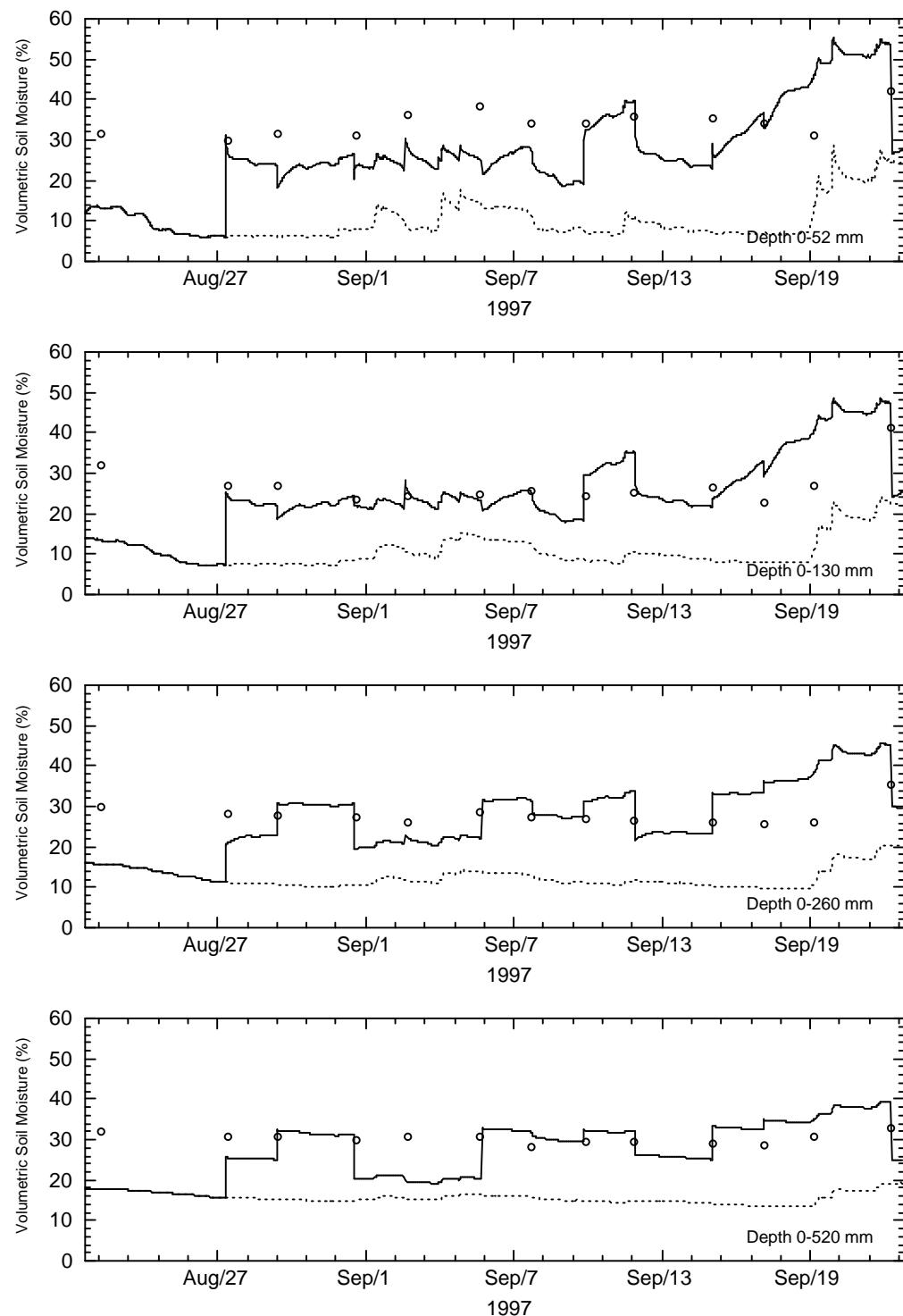


Figure F.72: Evaluation of soil moisture profile estimation at soil moisture profile number 7. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of soil moisture content.

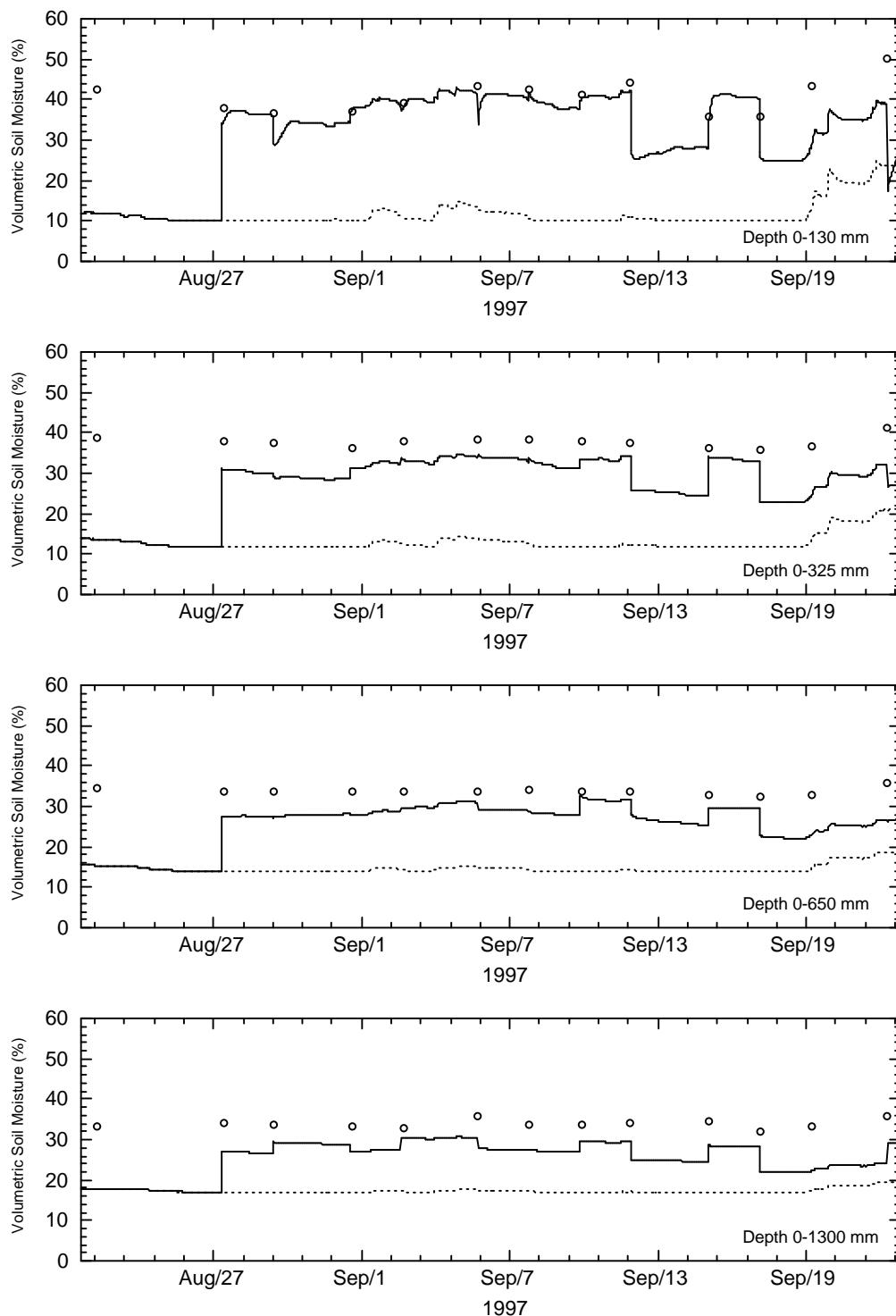


Figure F.73: Evaluation of soil moisture profile estimation at soil moisture profile number 8. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of soil moisture content.

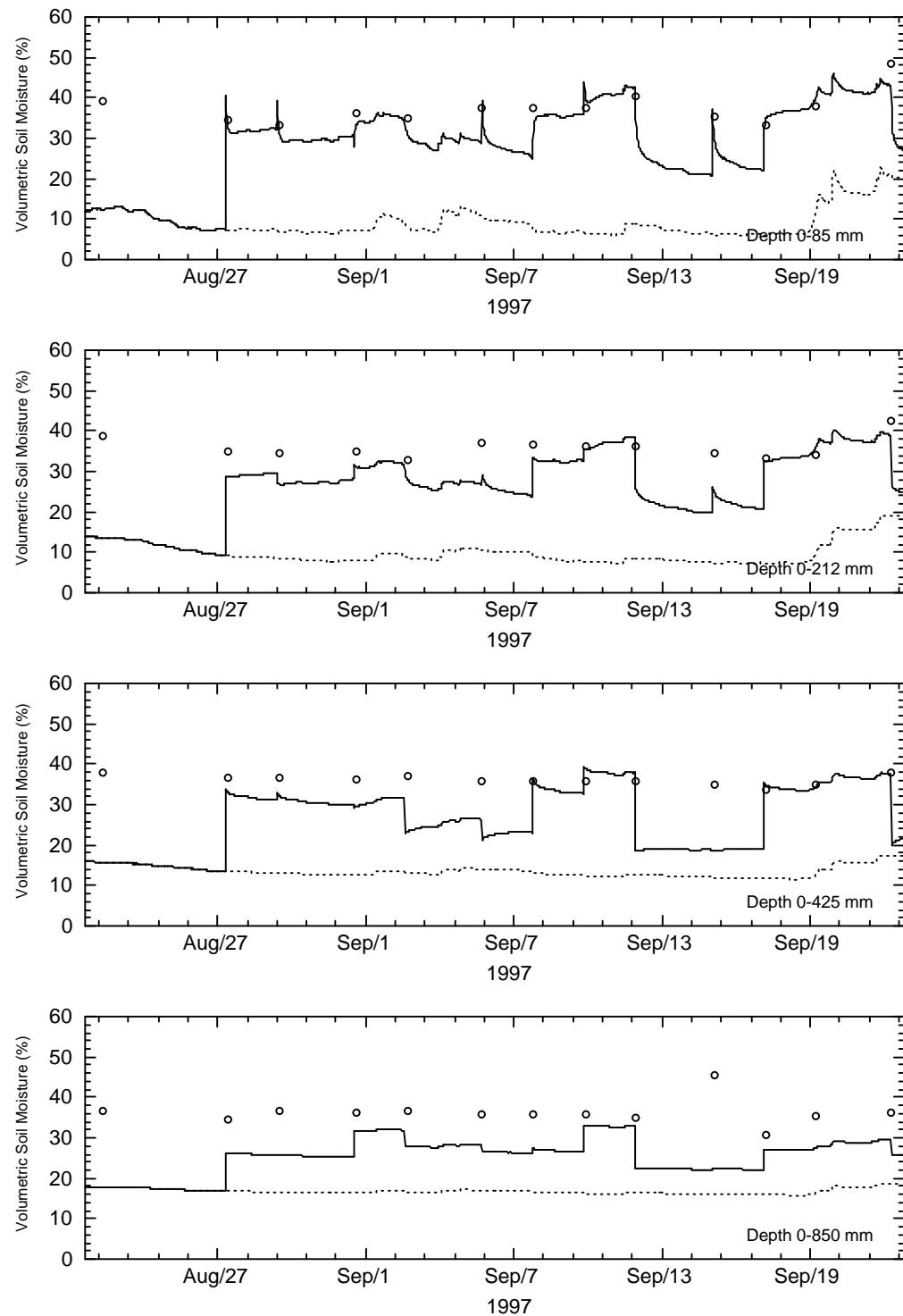


Figure F.74: Evaluation of soil moisture profile estimation at soil moisture profile number 9. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of soil moisture content.

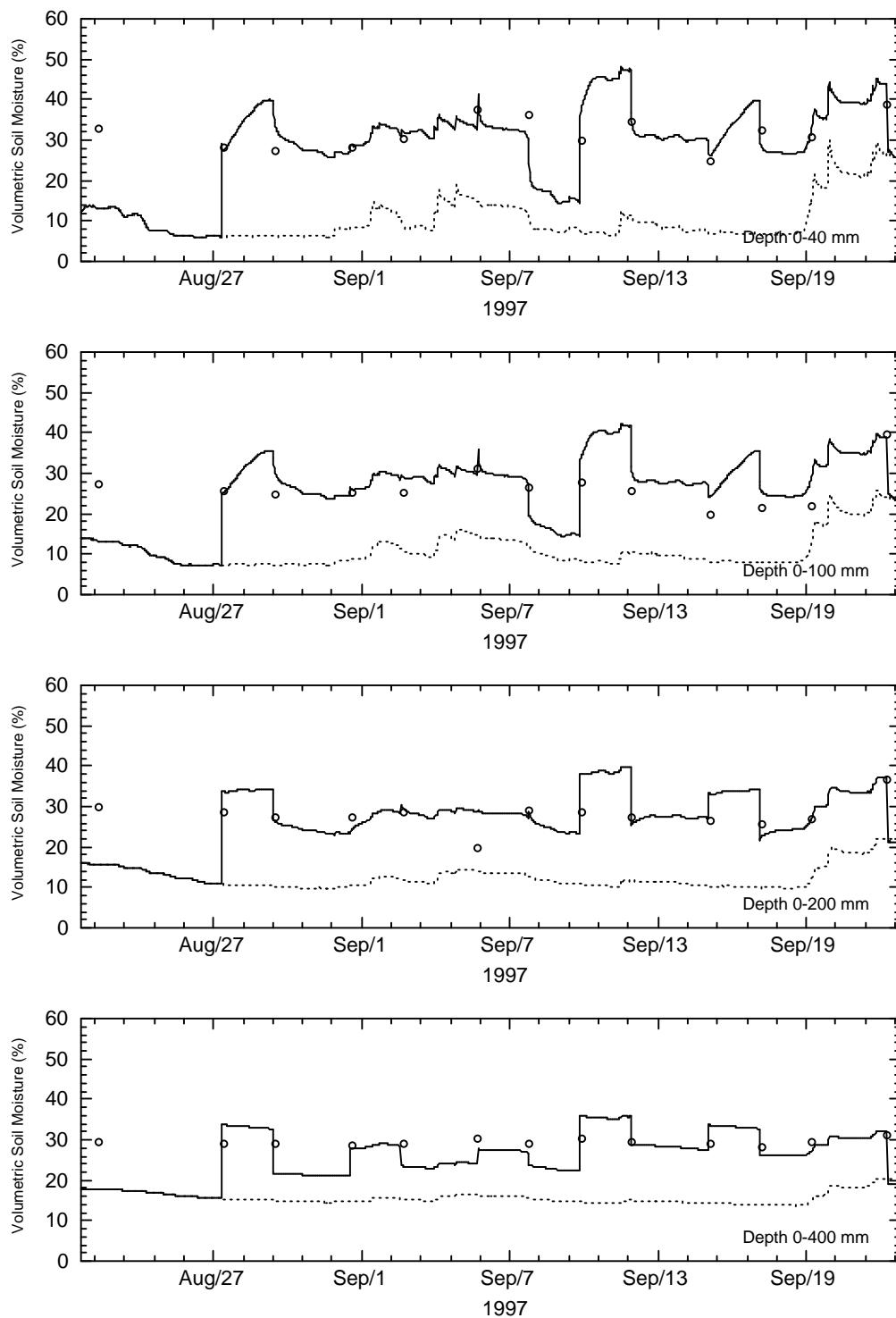


Figure F.75: Evaluation of soil moisture profile estimation at soil moisture profile number 10. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of soil moisture content.

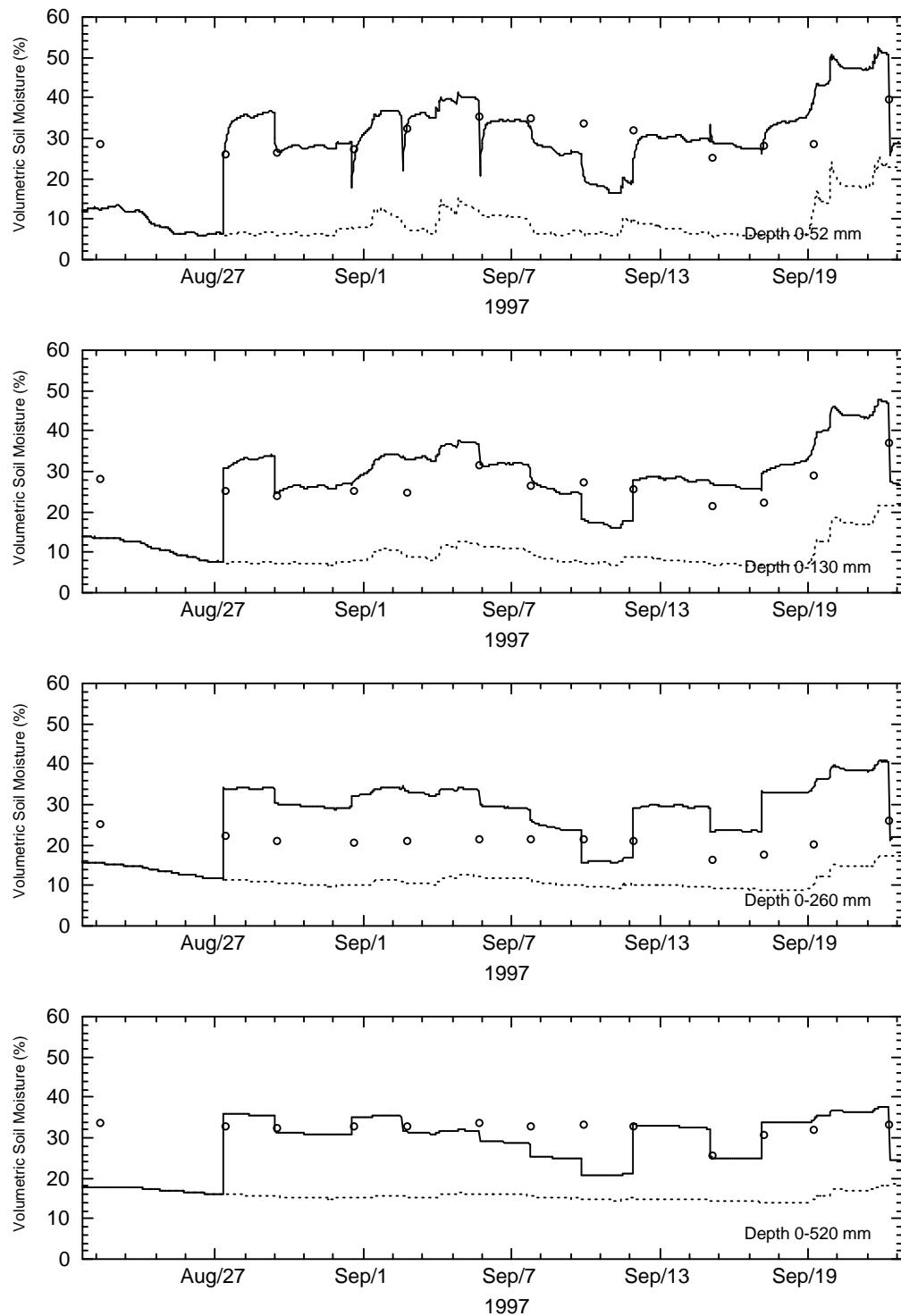


Figure F.76: Evaluation of soil moisture profile estimation at soil moisture profile number 11. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of soil moisture content.

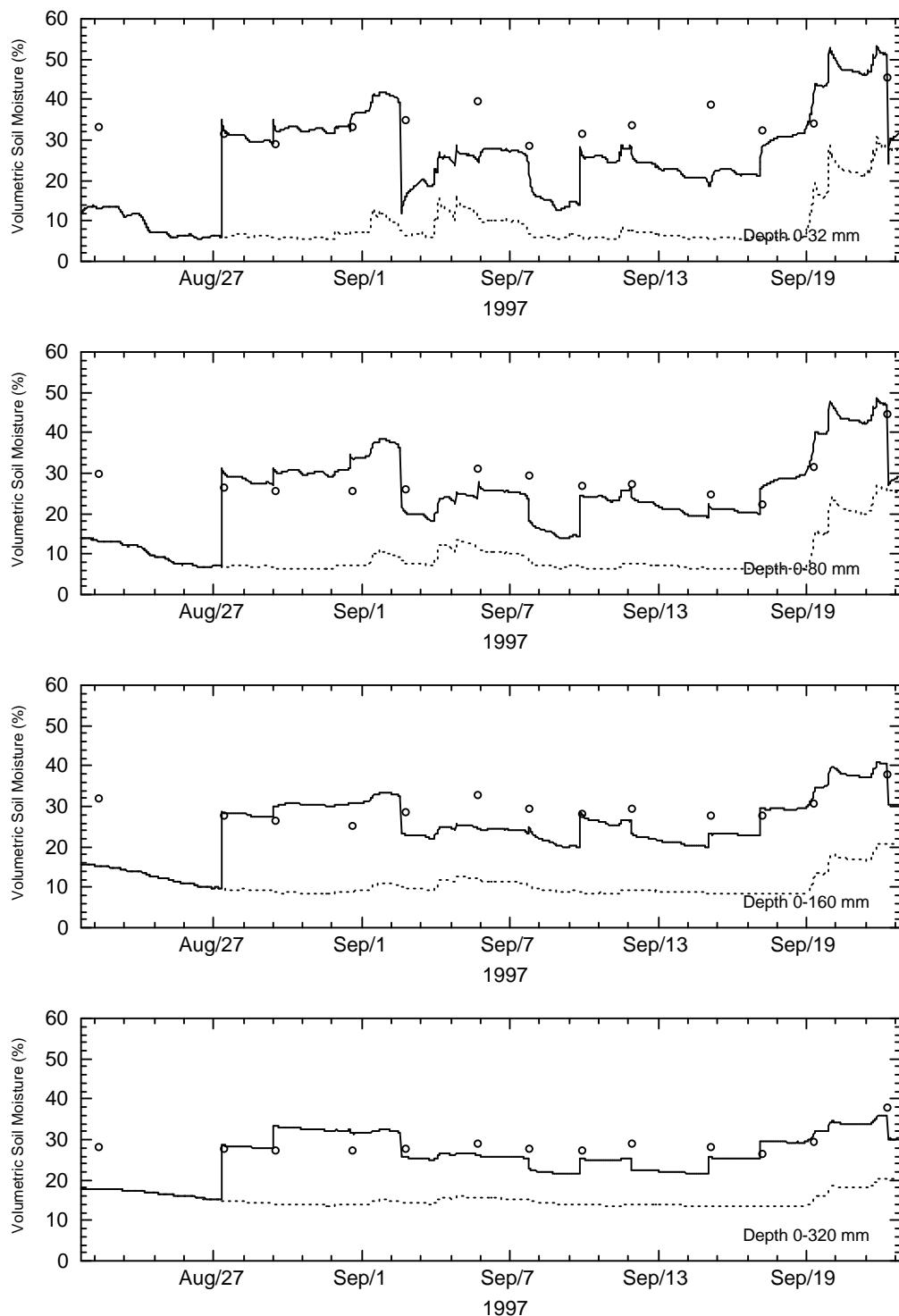


Figure F.77: Evaluation of soil moisture profile estimation at soil moisture profile number 12. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of soil moisture content.

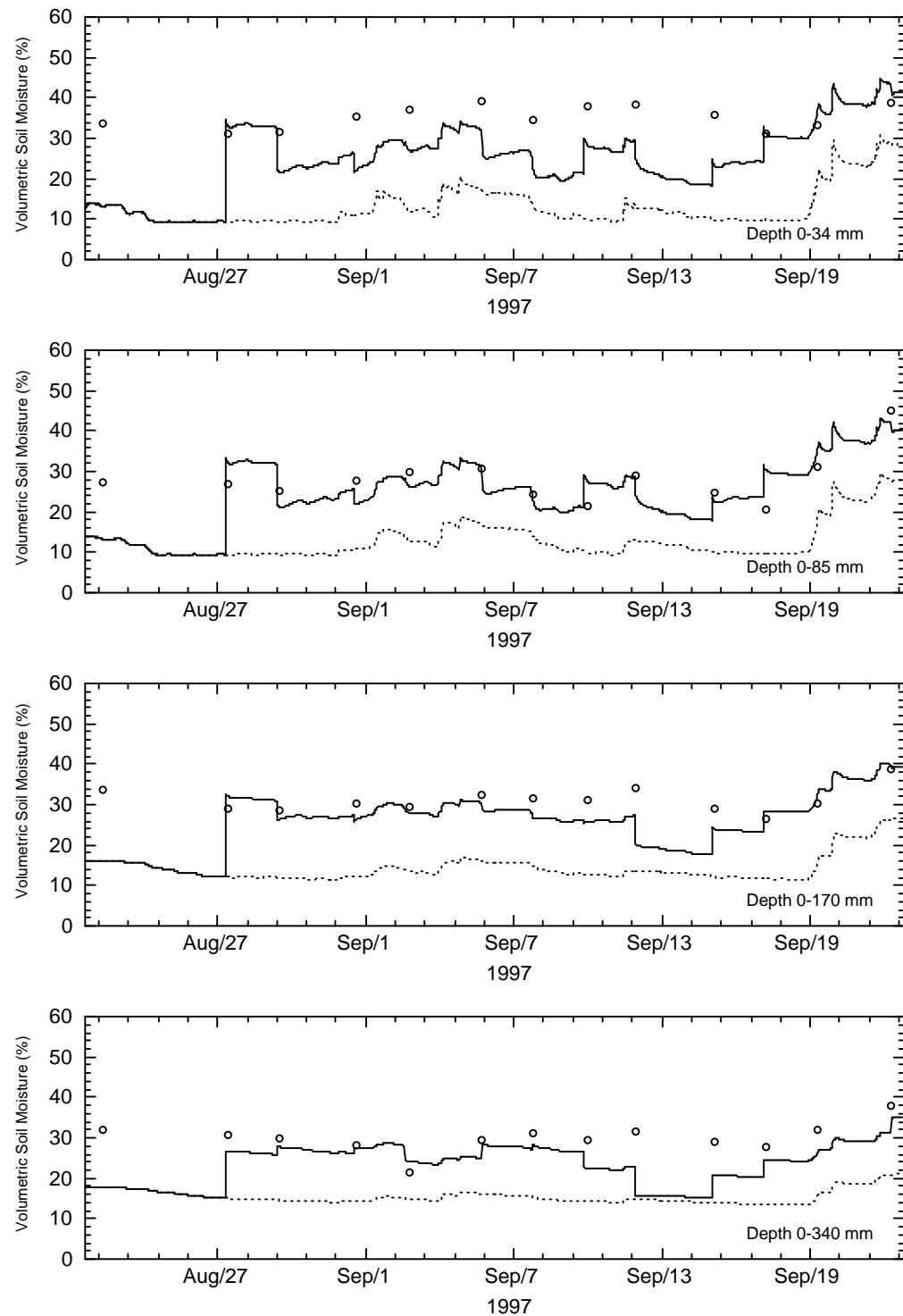


Figure F.78: Evaluation of soil moisture profile estimation at soil moisture profile number 13. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of soil moisture content.

F.3.5 A SINGLE UPDATE OF THE SOIL MOISTURE PROFILE

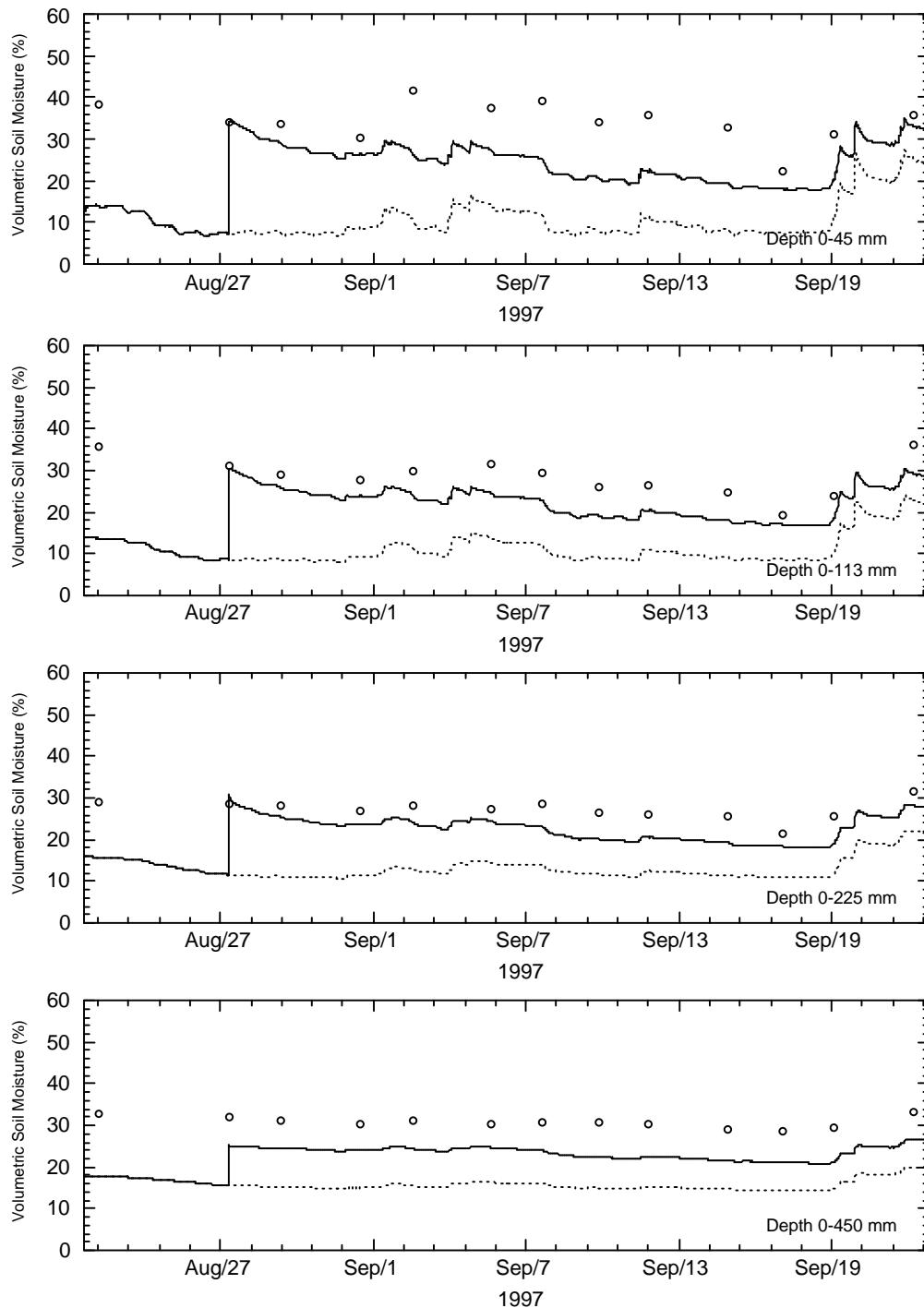


Figure F.79: Evaluation of soil moisture profile estimation at soil moisture profile number 1. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with only the first set of modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of the soil moisture content.

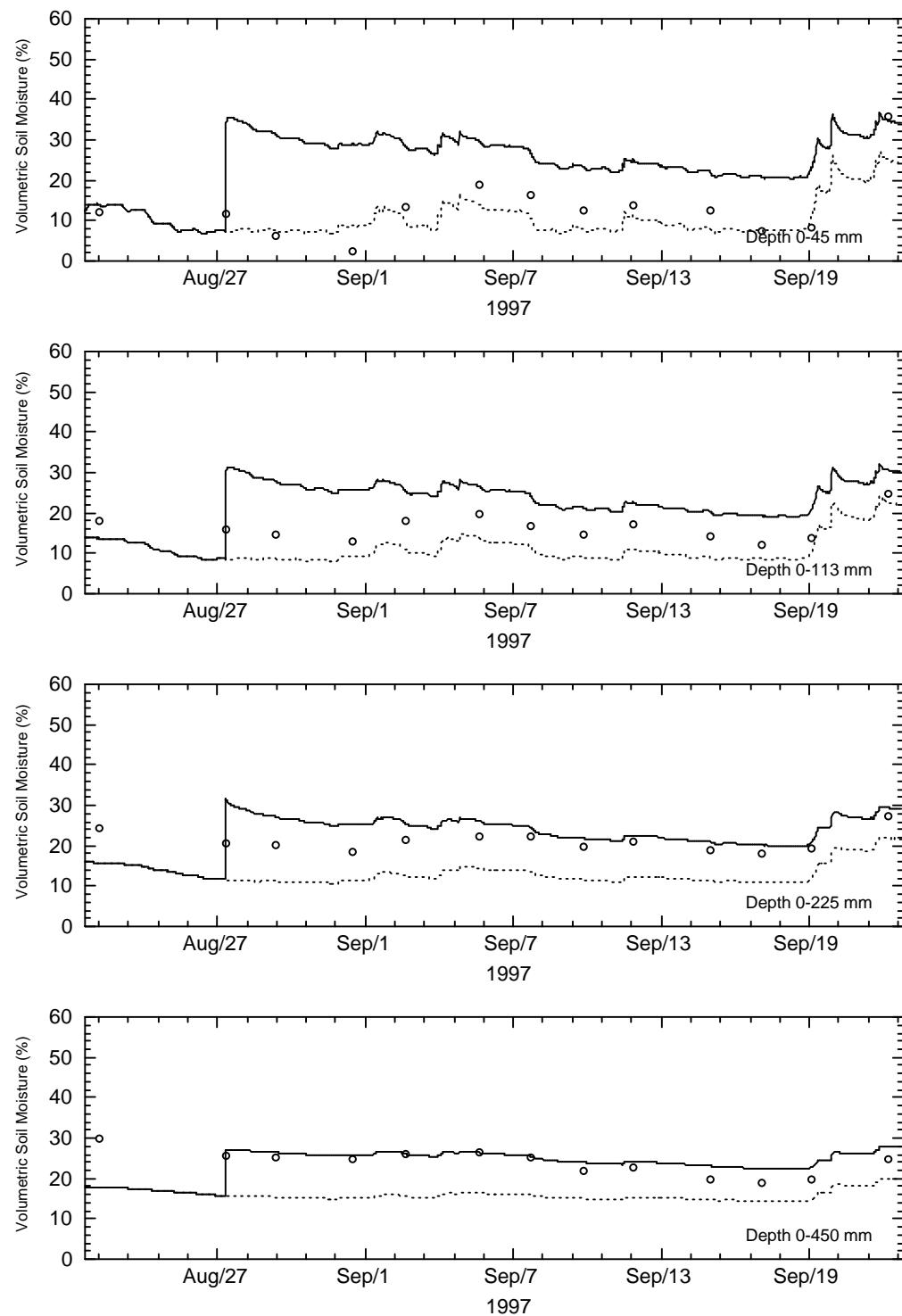


Figure F.80: Evaluation of soil moisture profile estimation at soil moisture profile number 2. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with only the first set of modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of the soil moisture content.

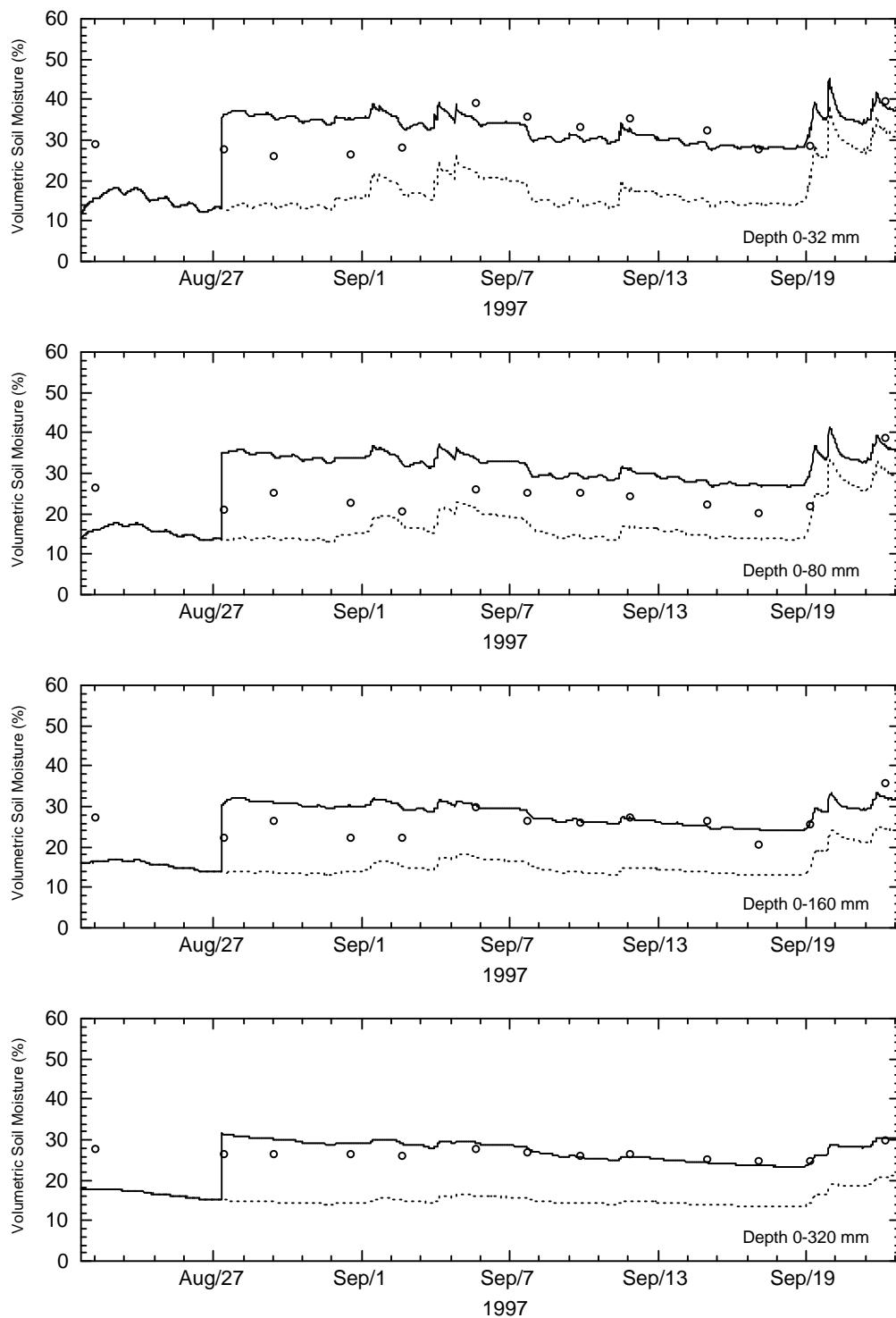


Figure F.81: Evaluation of soil moisture profile estimation at soil moisture profile number 3. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with only the first set of modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of the soil moisture content.

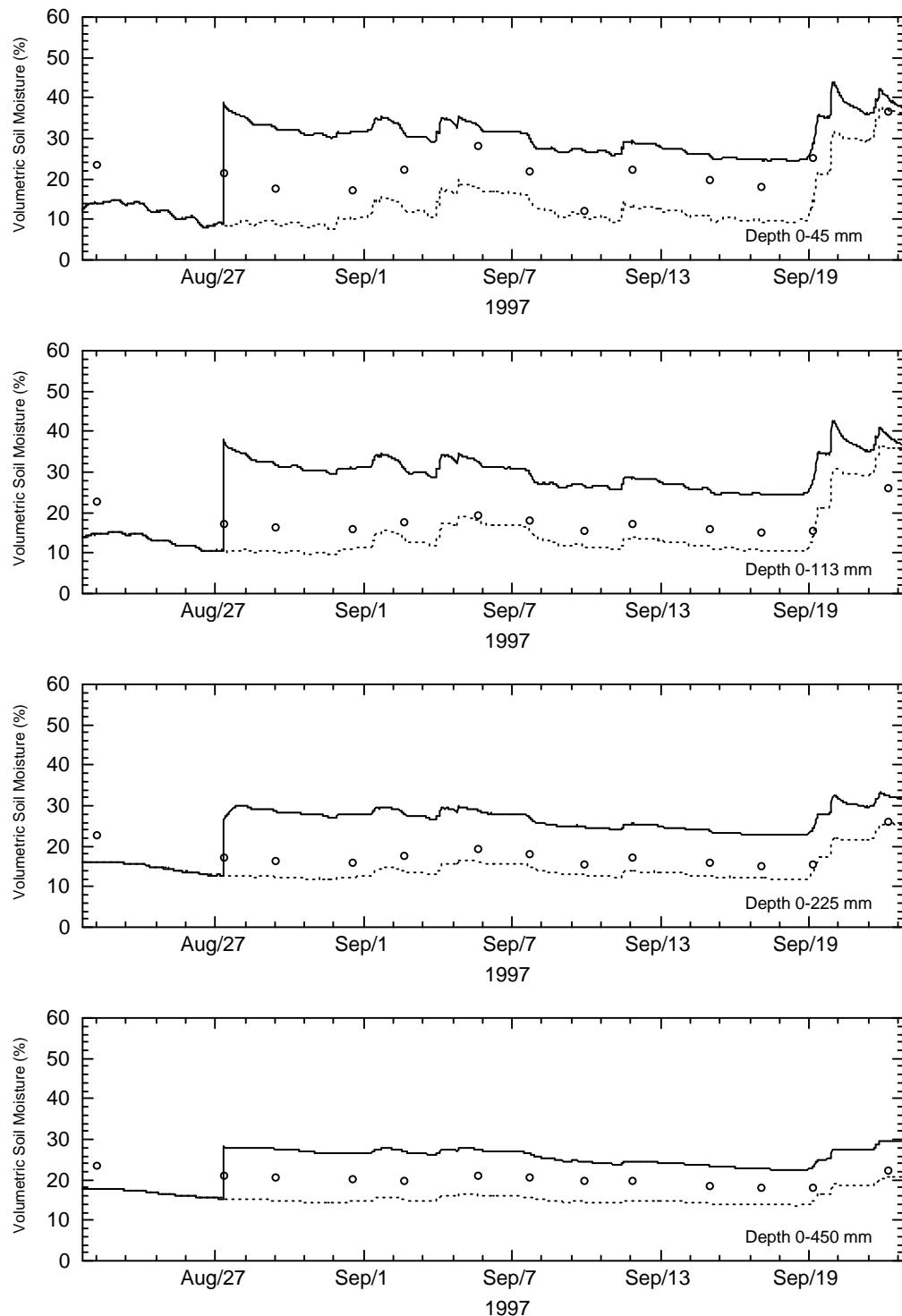


Figure F.82: Evaluation of soil moisture profile estimation at soil moisture profile number 4. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with only the first set of modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of the soil moisture content.

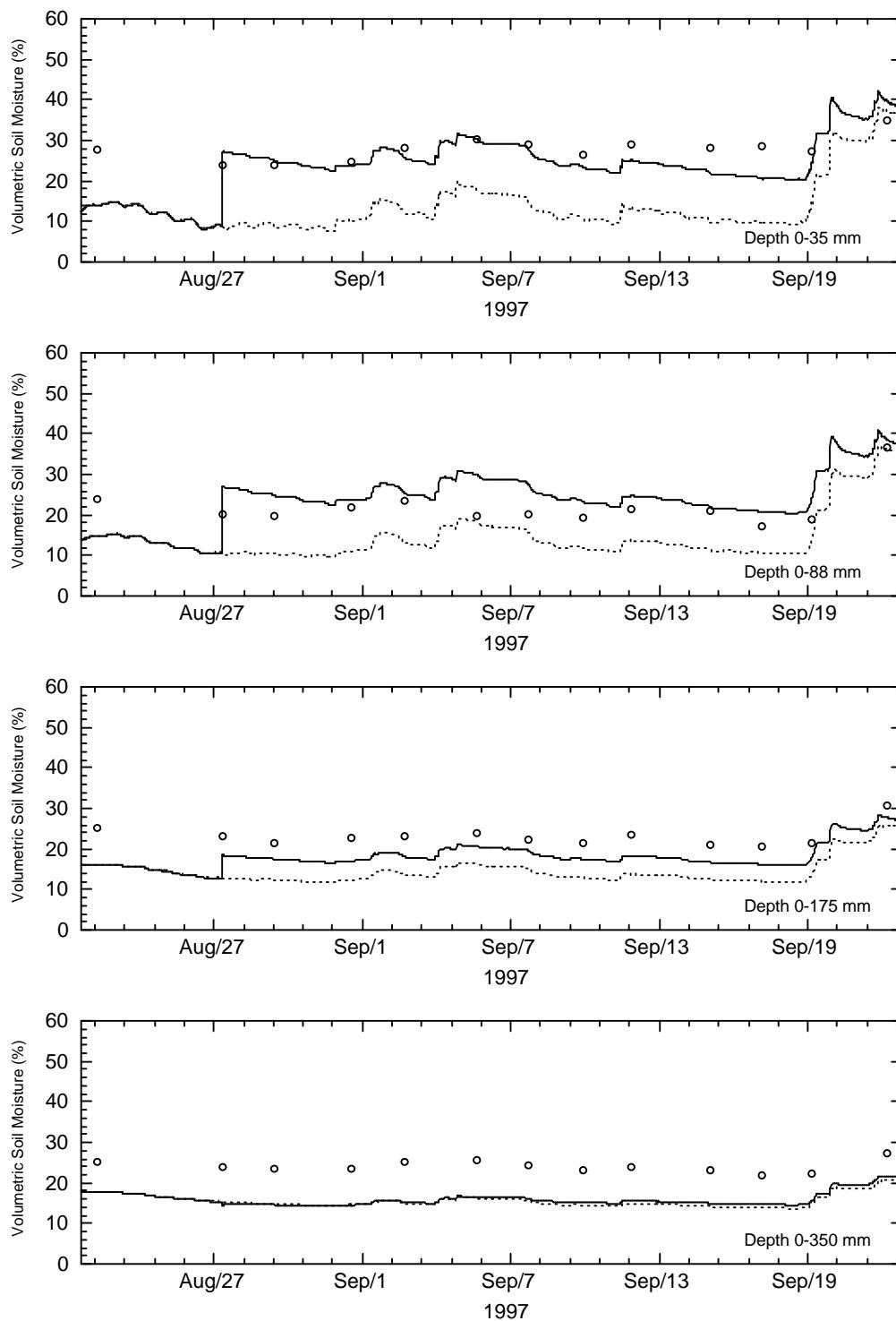


Figure F.83: Evaluation of soil moisture profile estimation at soil moisture profile number 5. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with only the first set of modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of the soil moisture content.

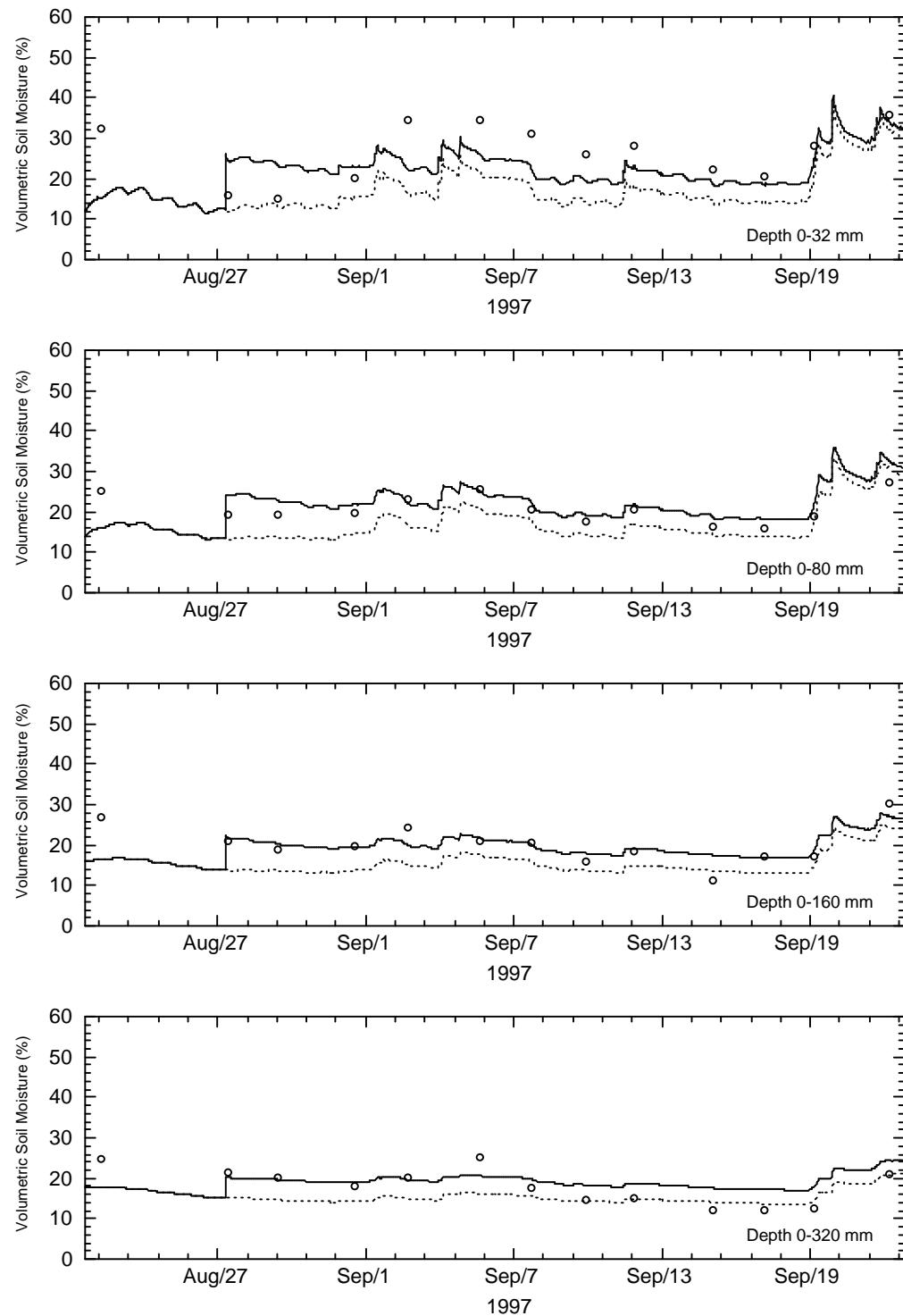


Figure F.84: Evaluation of soil moisture profile estimation at soil moisture profile number 6. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with only the first set of modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of the soil moisture content.

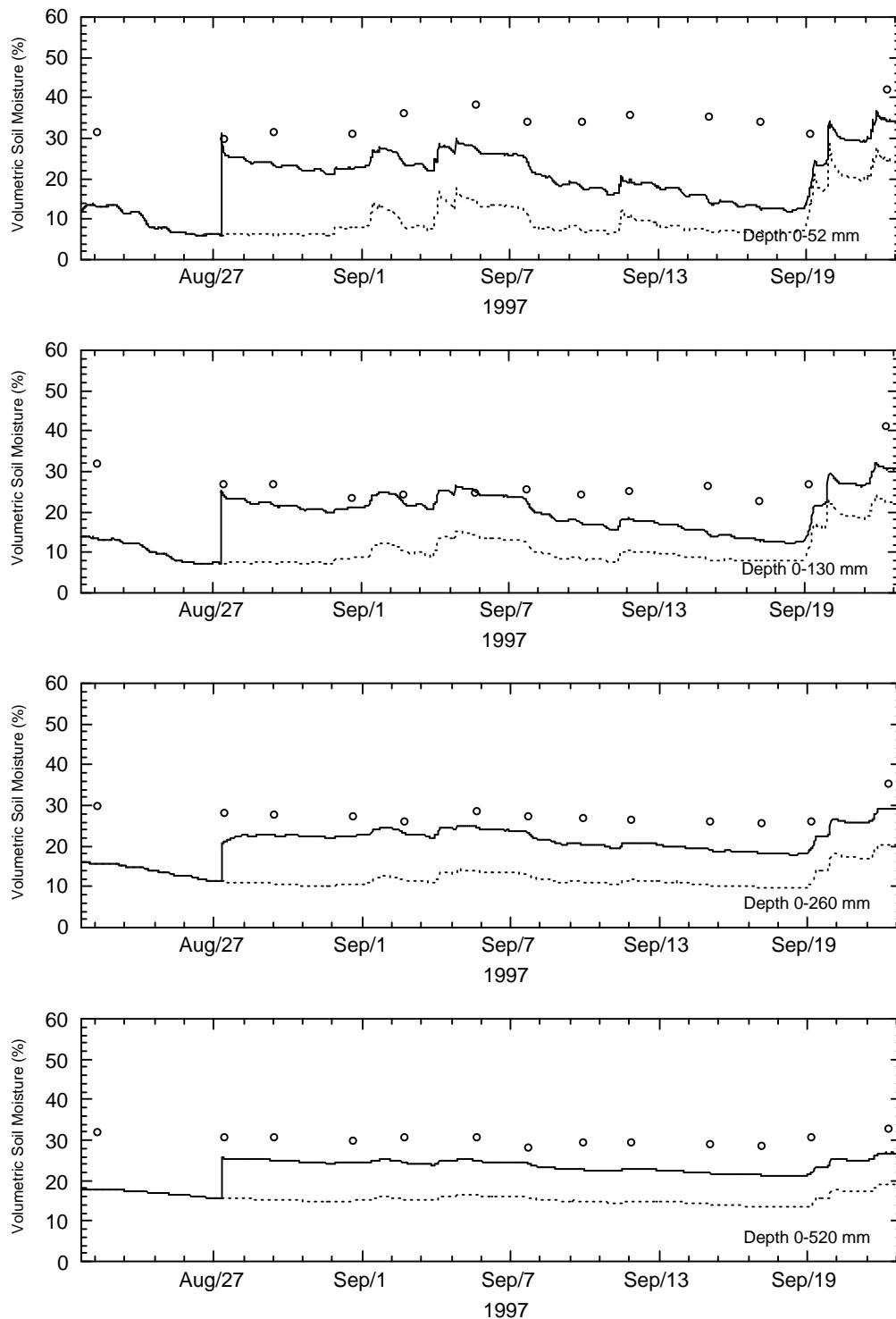


Figure F.85: Evaluation of soil moisture profile estimation at soil moisture profile number 7. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with only the first set of modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of the soil moisture content.

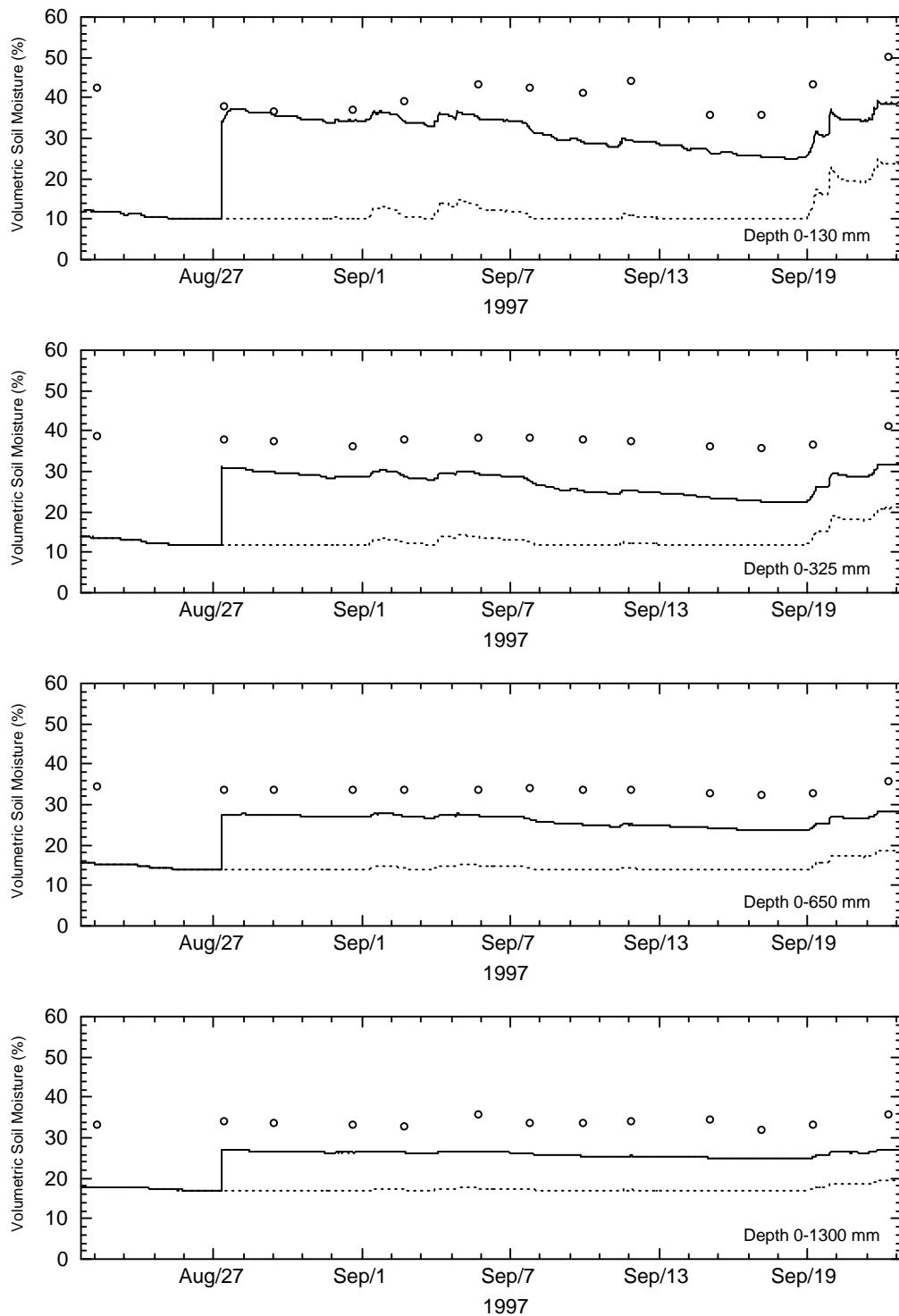


Figure F.86: Evaluation of soil moisture profile estimation at soil moisture profile number 8. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with only the first set of modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of the soil moisture content.

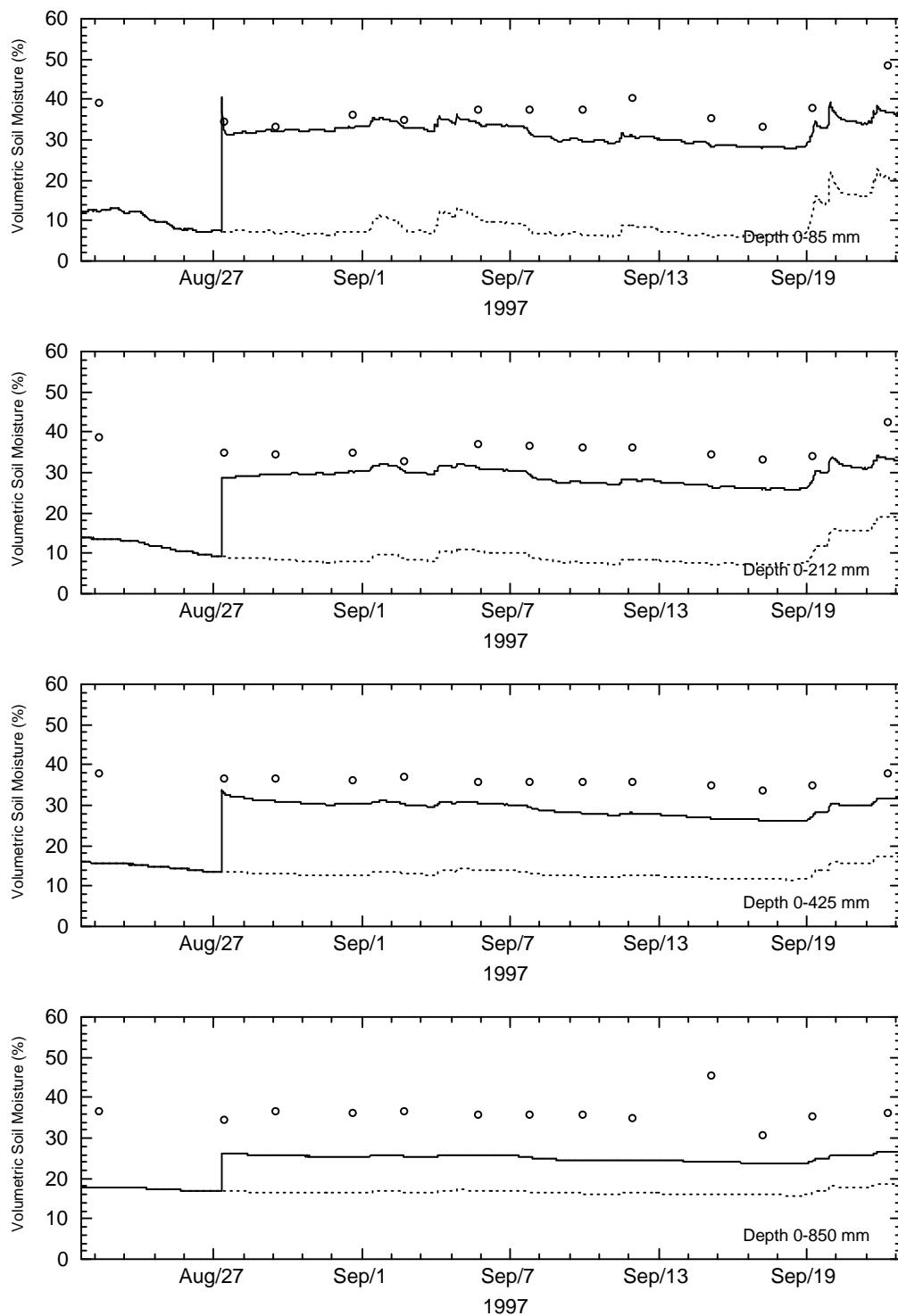


Figure F.87: Evaluation of soil moisture profile estimation at soil moisture profile number 9. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with only the first set of modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of the soil moisture content.

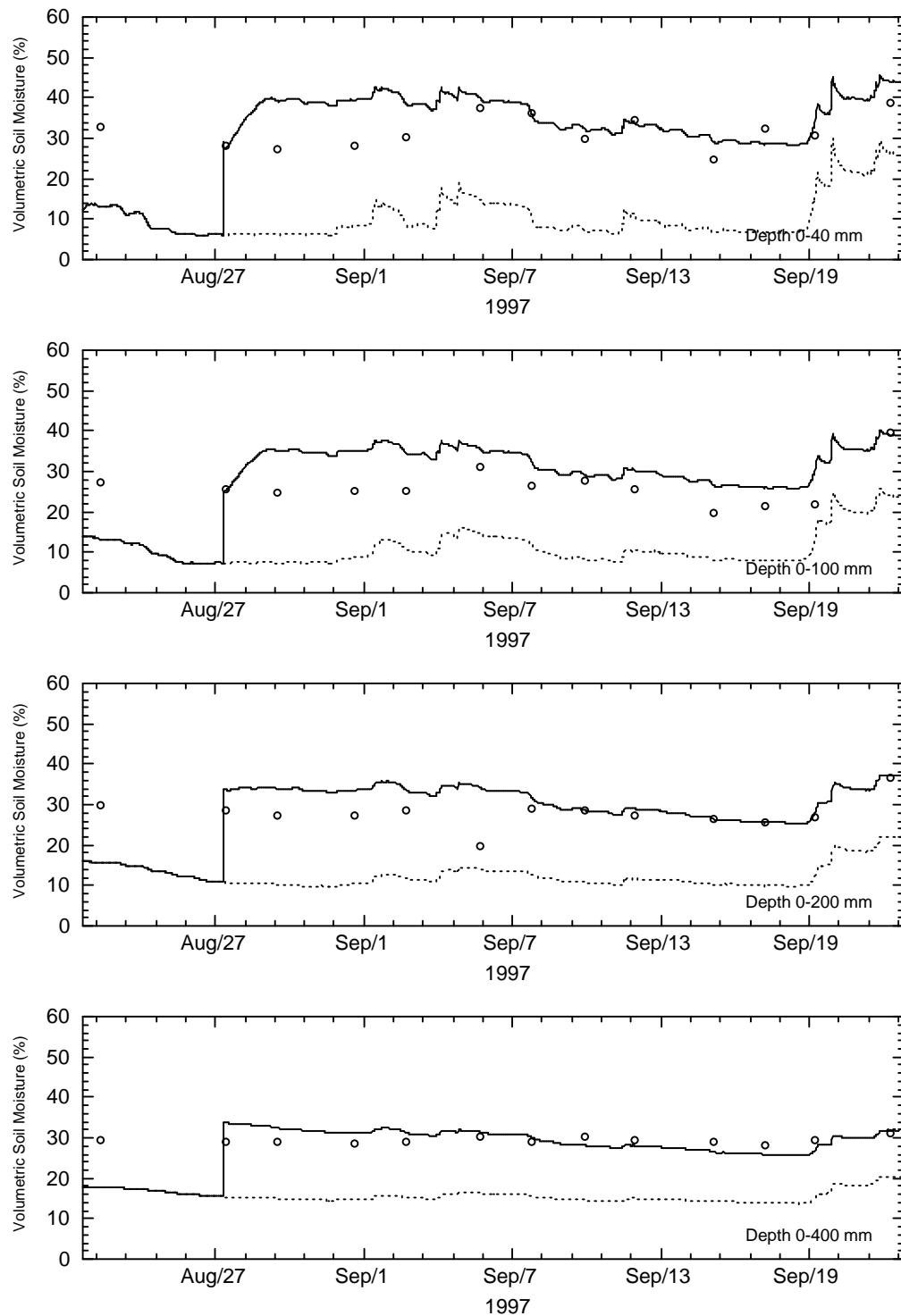


Figure F.88: Evaluation of soil moisture profile estimation at soil moisture profile number 10. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with only the first set of modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of the soil moisture content.

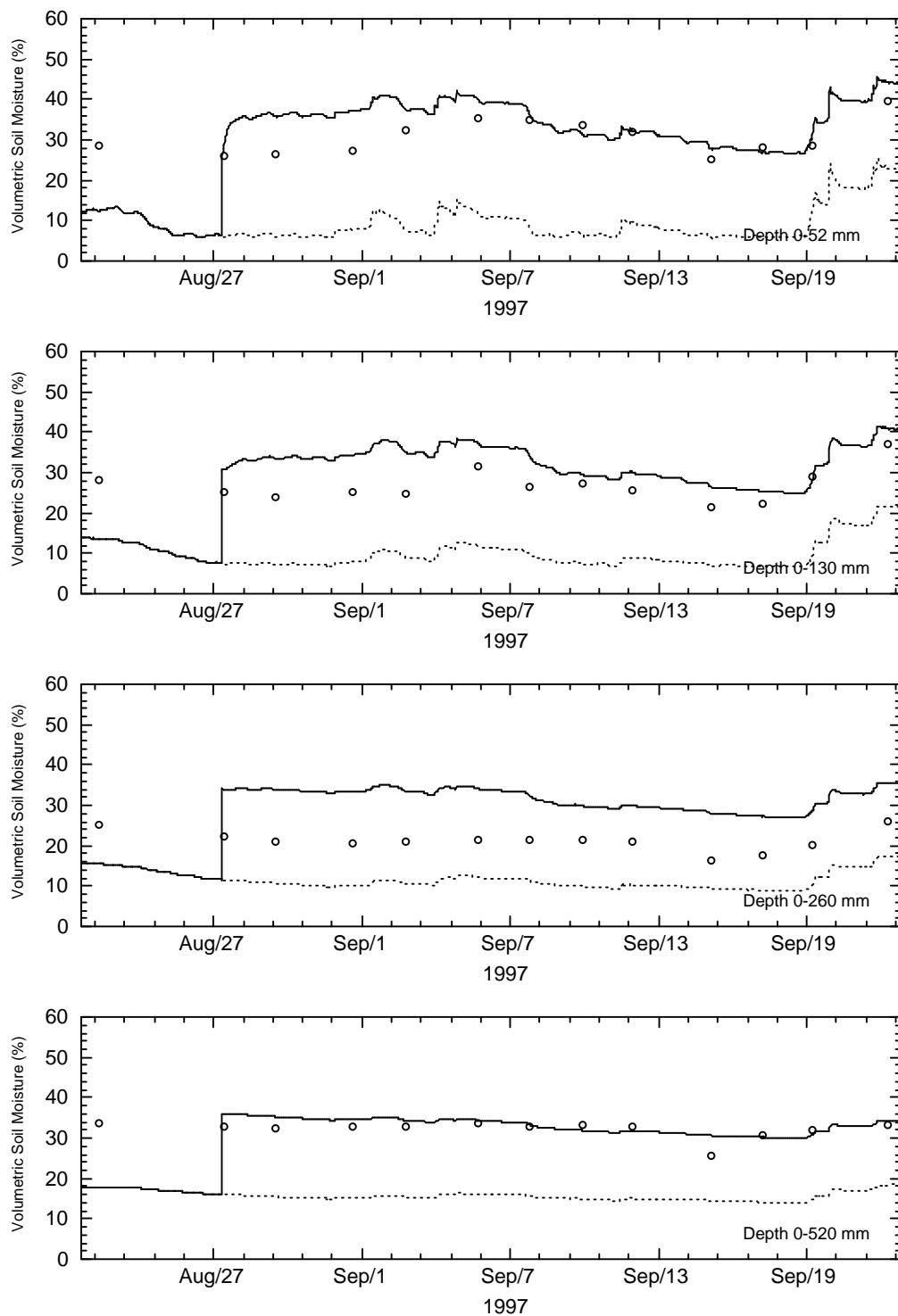


Figure F.89: Evaluation of soil moisture profile estimation at soil moisture profile number 11. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with only the first set of modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of the soil moisture content.

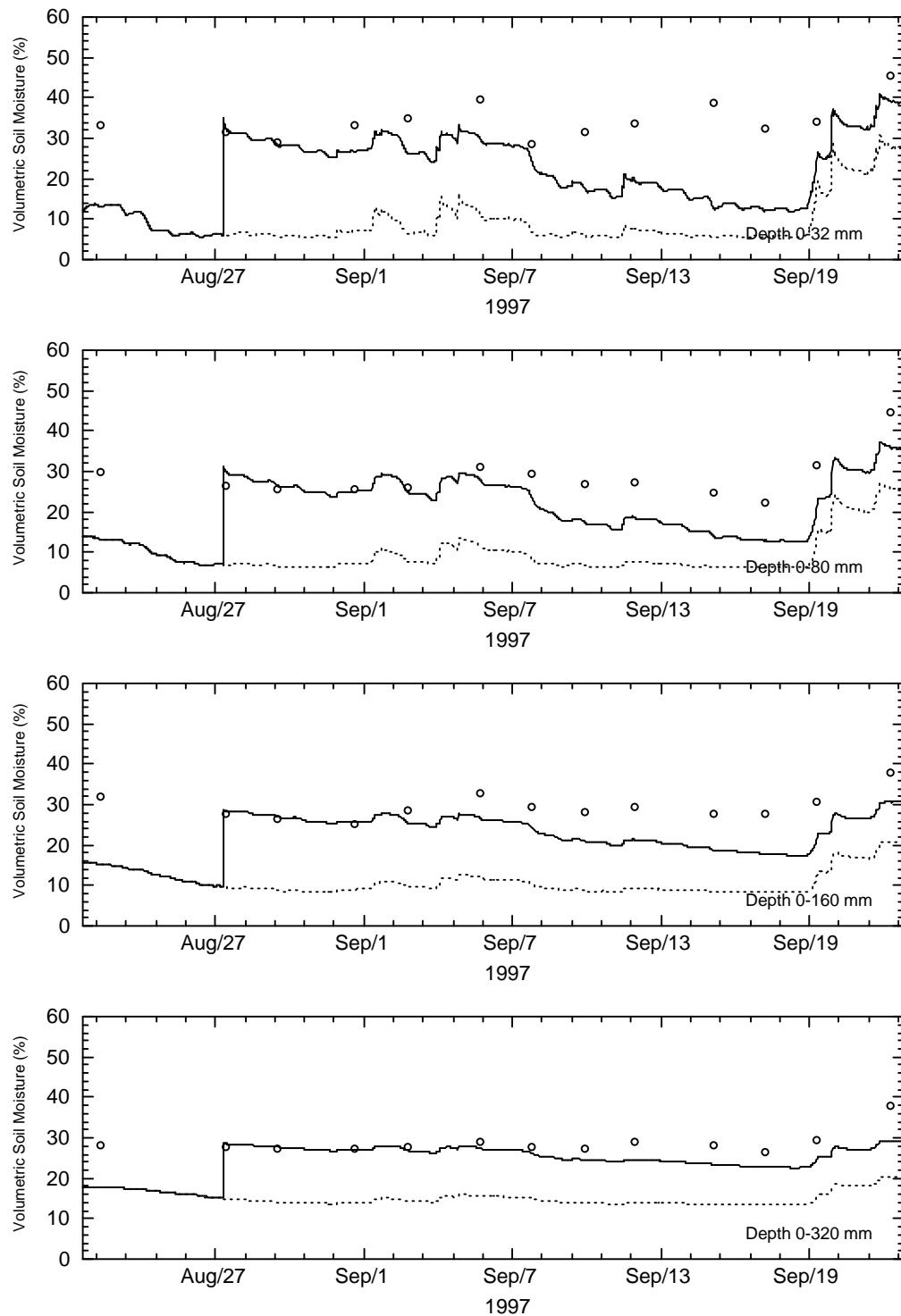


Figure F.90: Evaluation of soil moisture profile estimation at soil moisture profile number 12. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with only the first set of modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of the soil moisture content.

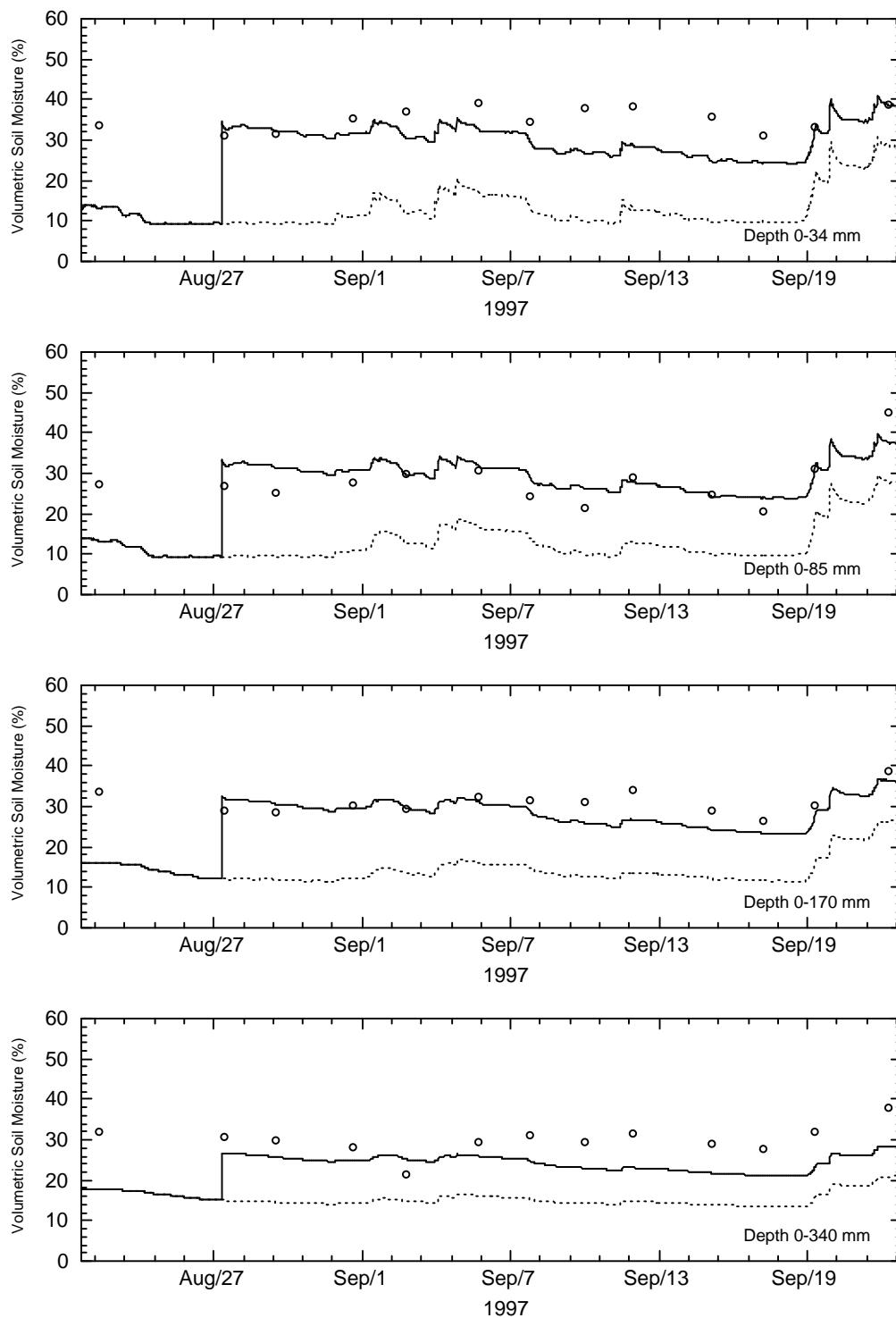


Figure F.91: Evaluation of soil moisture profile estimation at soil moisture profile number 13. Connector TDR soil moisture observations (open circles) are compared against the estimated soil moisture profile (solid line) with only the first set of modified near-surface soil moisture observations and open loop simulation results (dashed line) for simulations initiated with a poor initial guess of the soil moisture content.