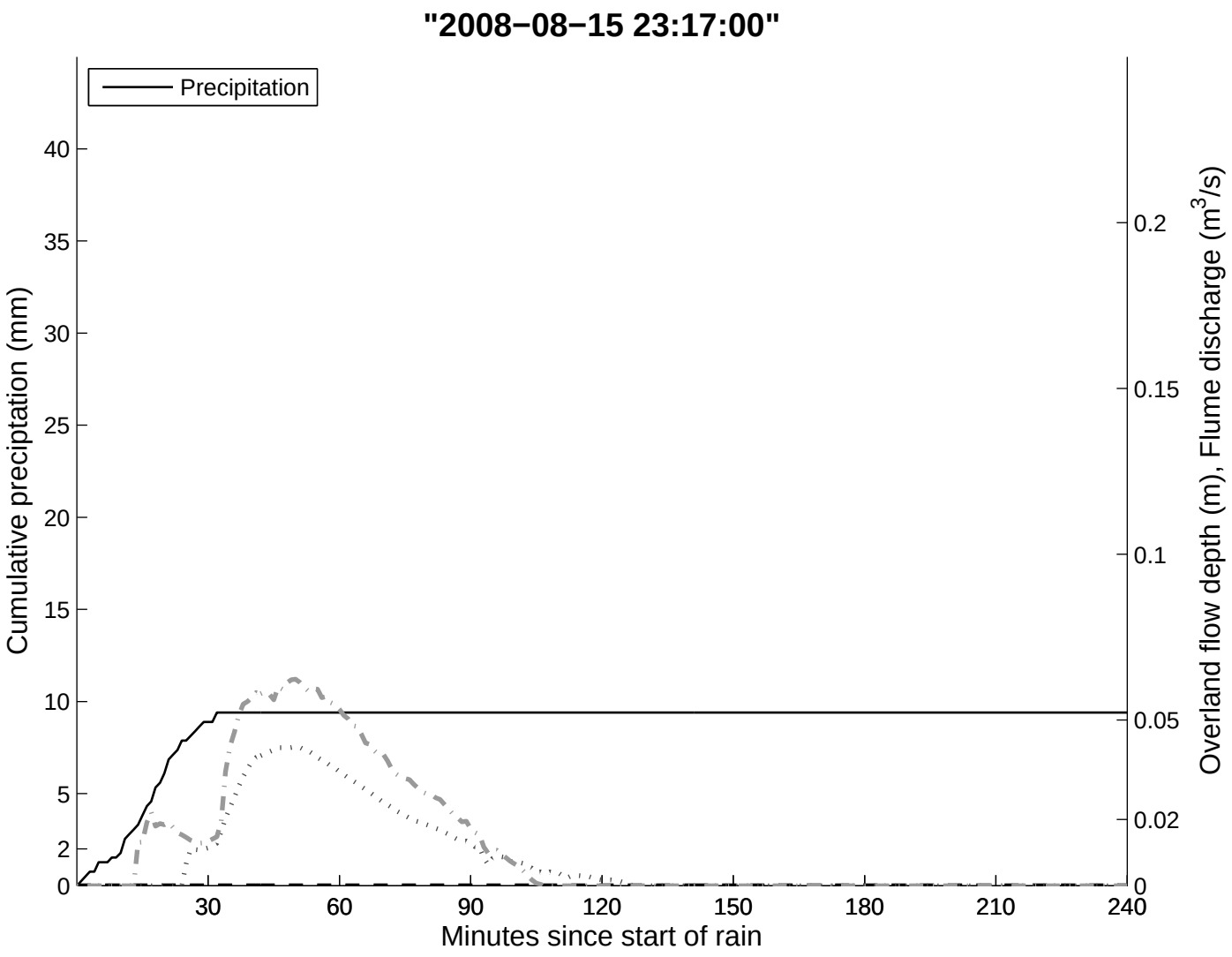
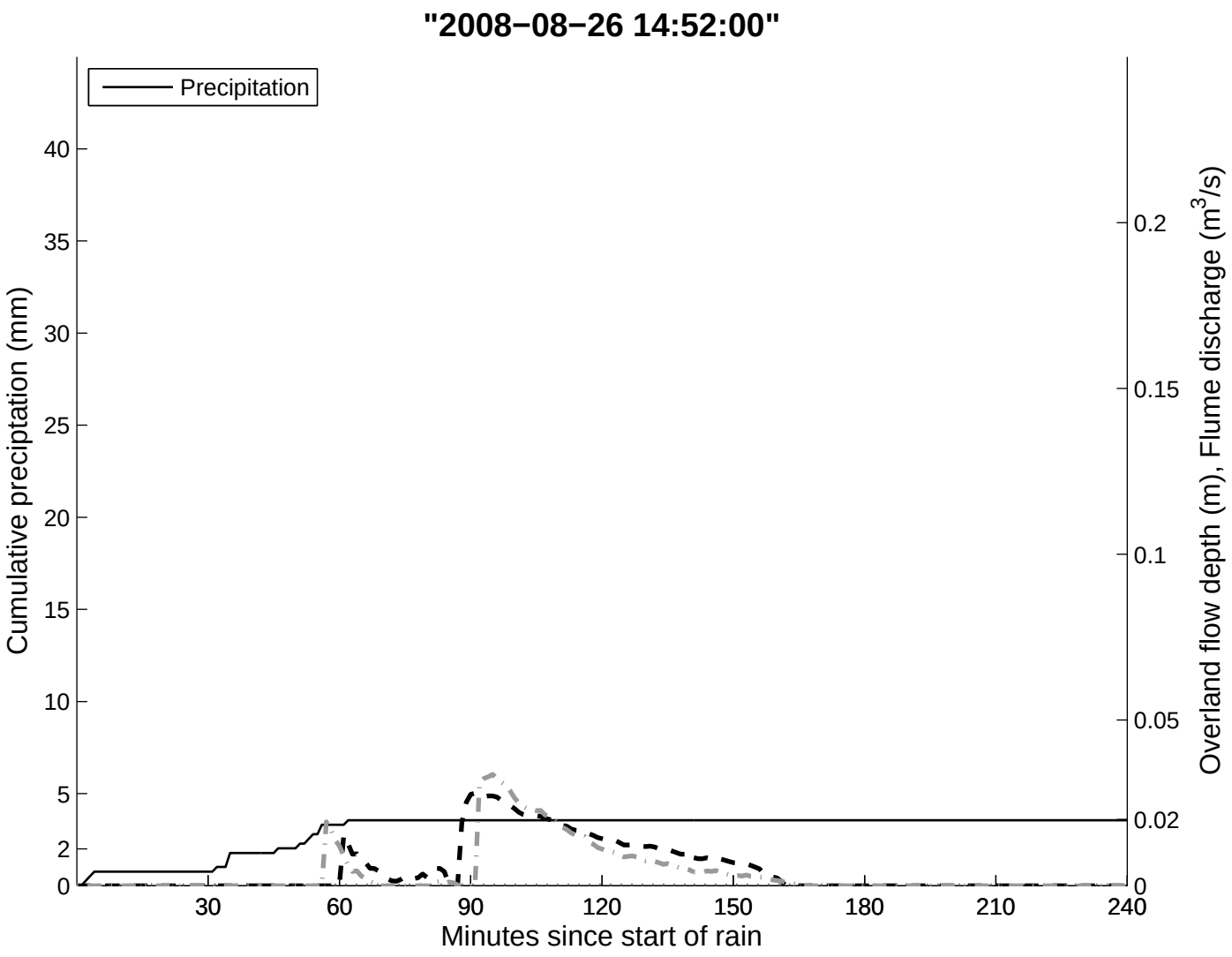
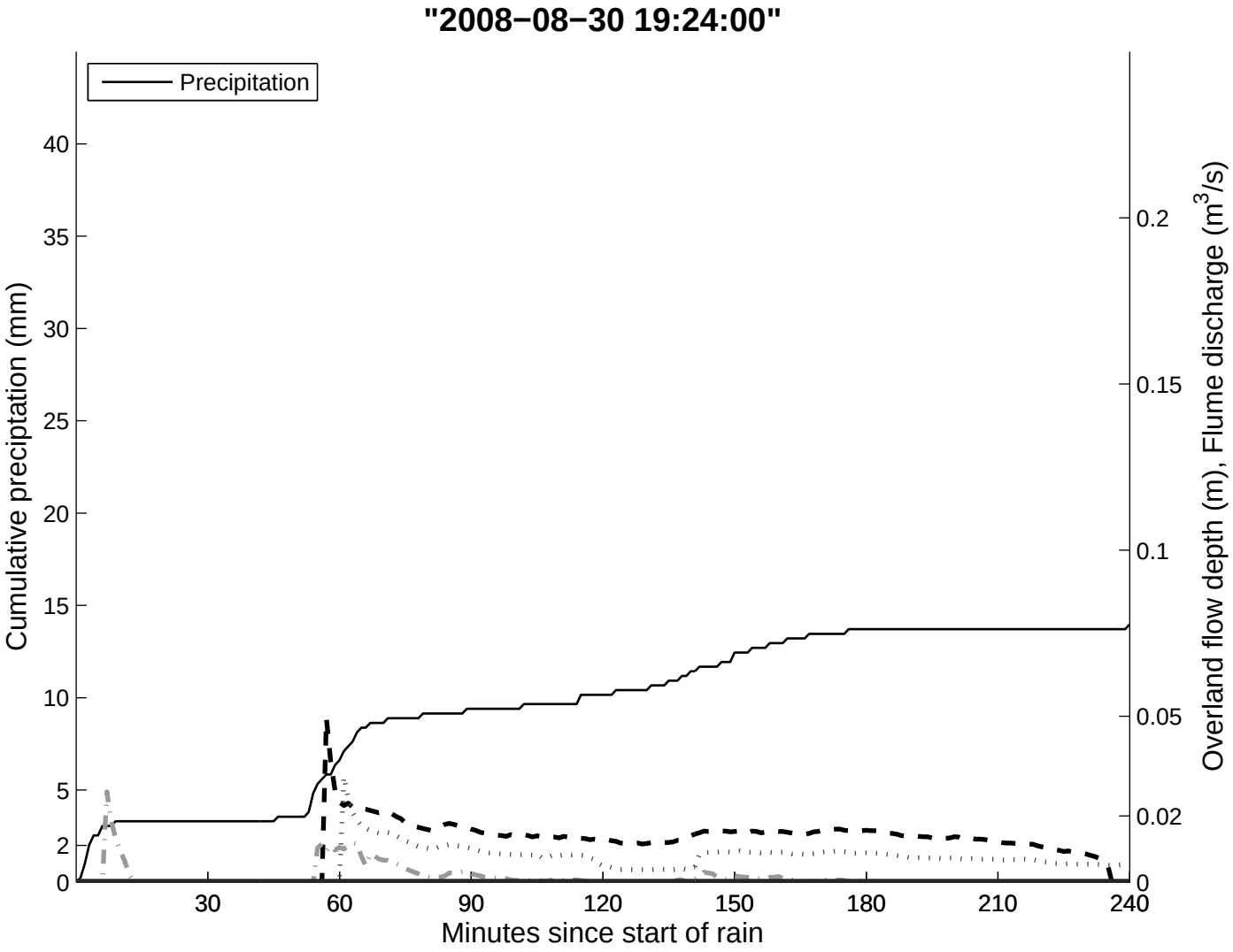
This file contains plots of overland flow and soil moisture for all runoff events

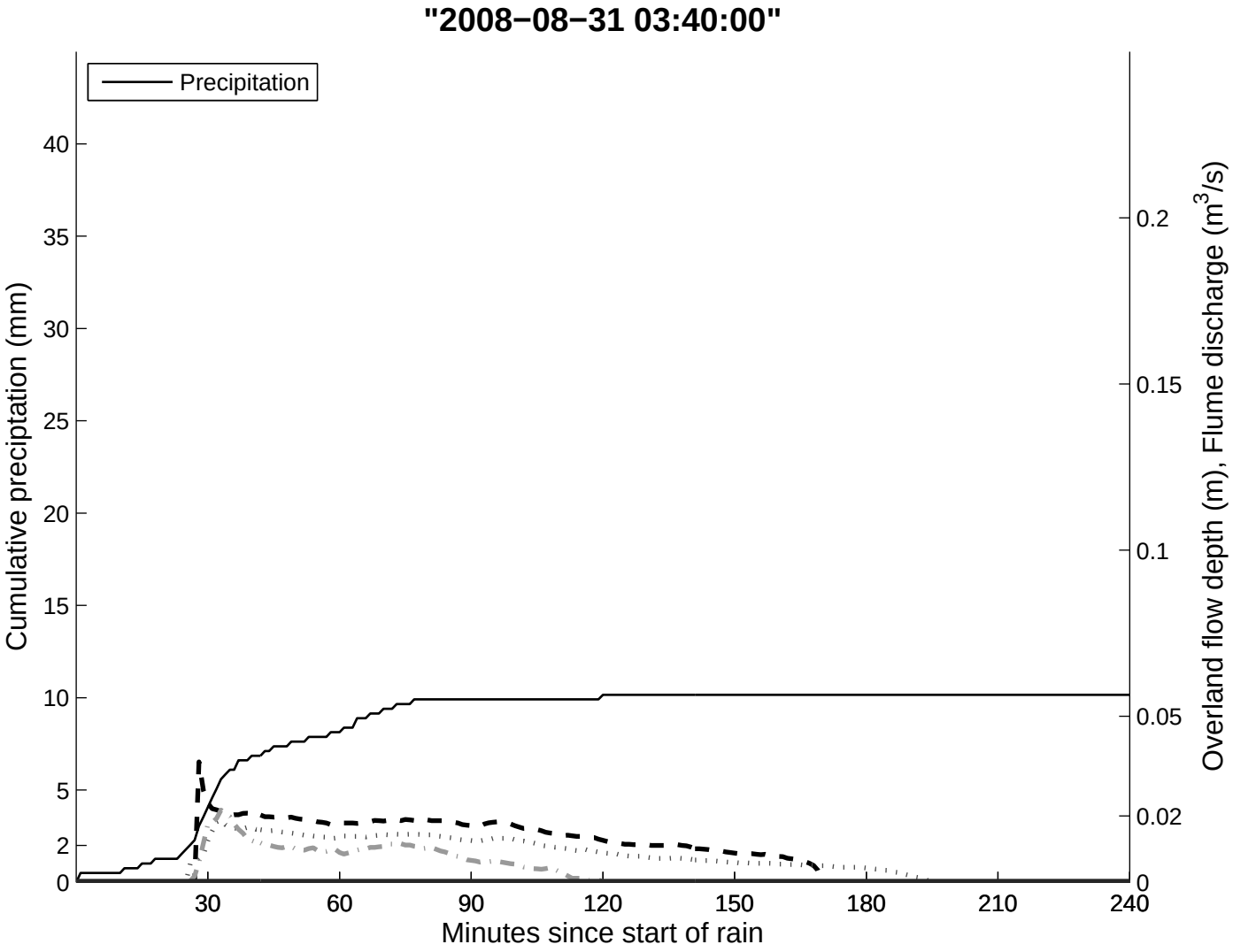
Date and time of plot start in timestamp on top of plot.

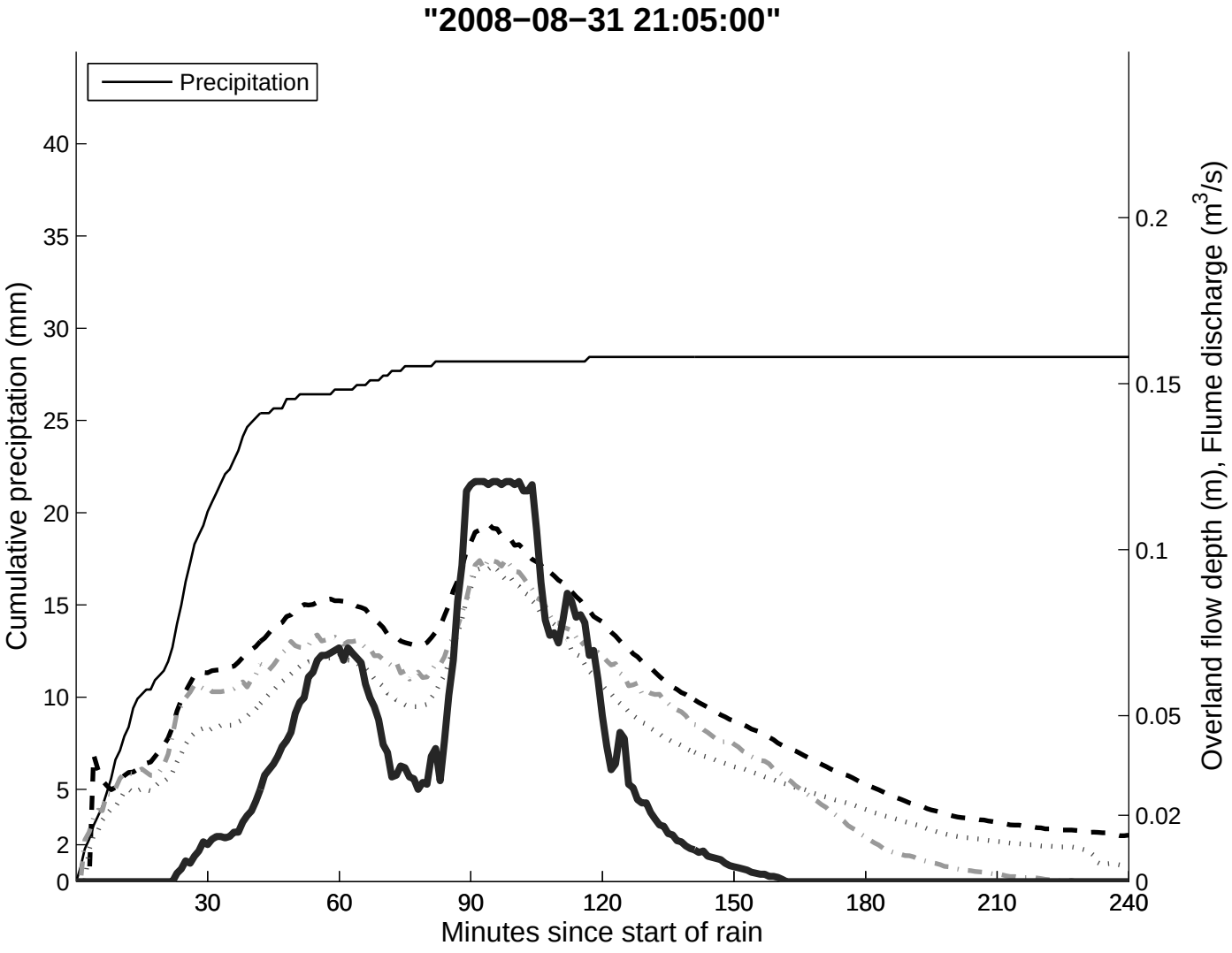
Plot legends:

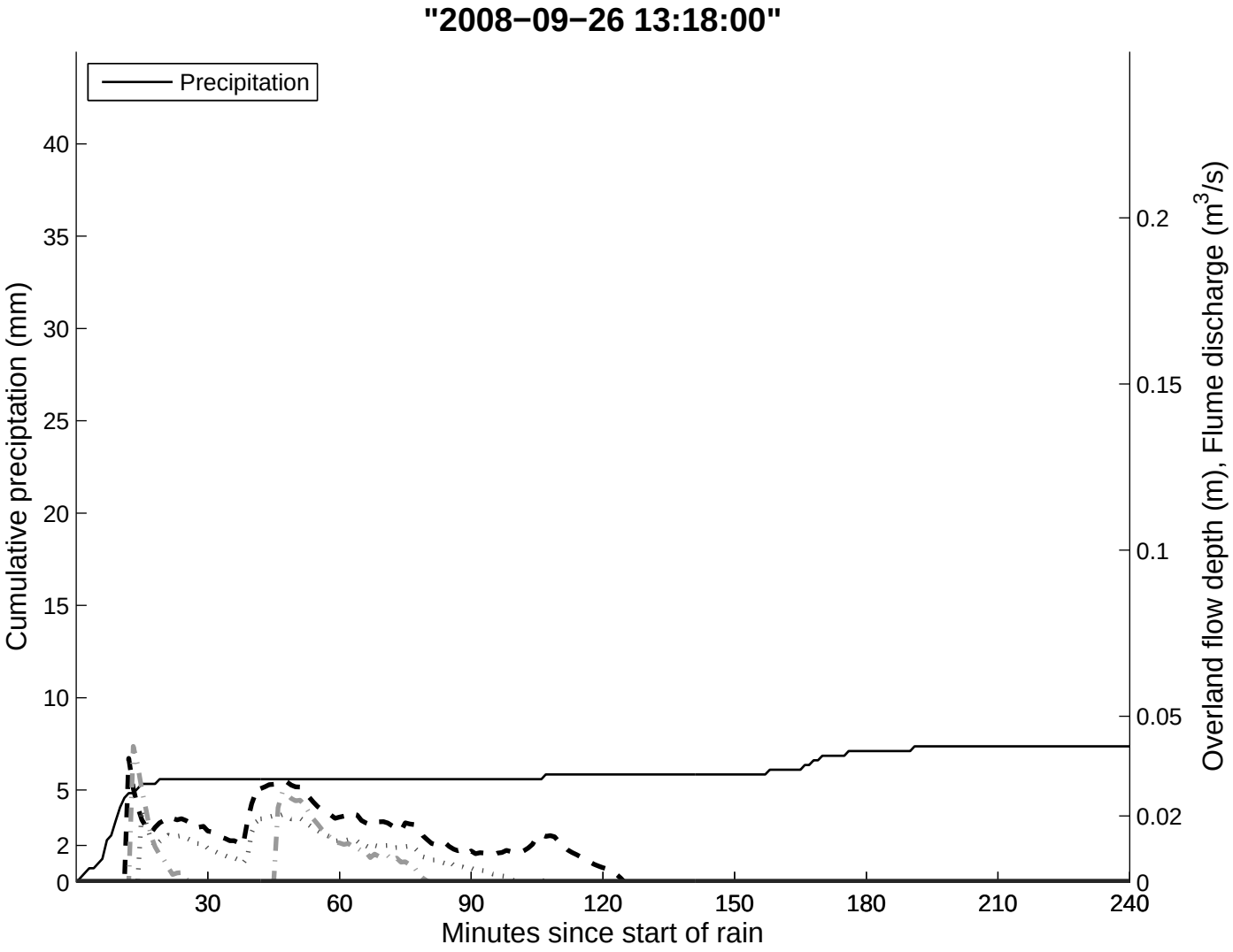

"2008−08−15 23:17:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240

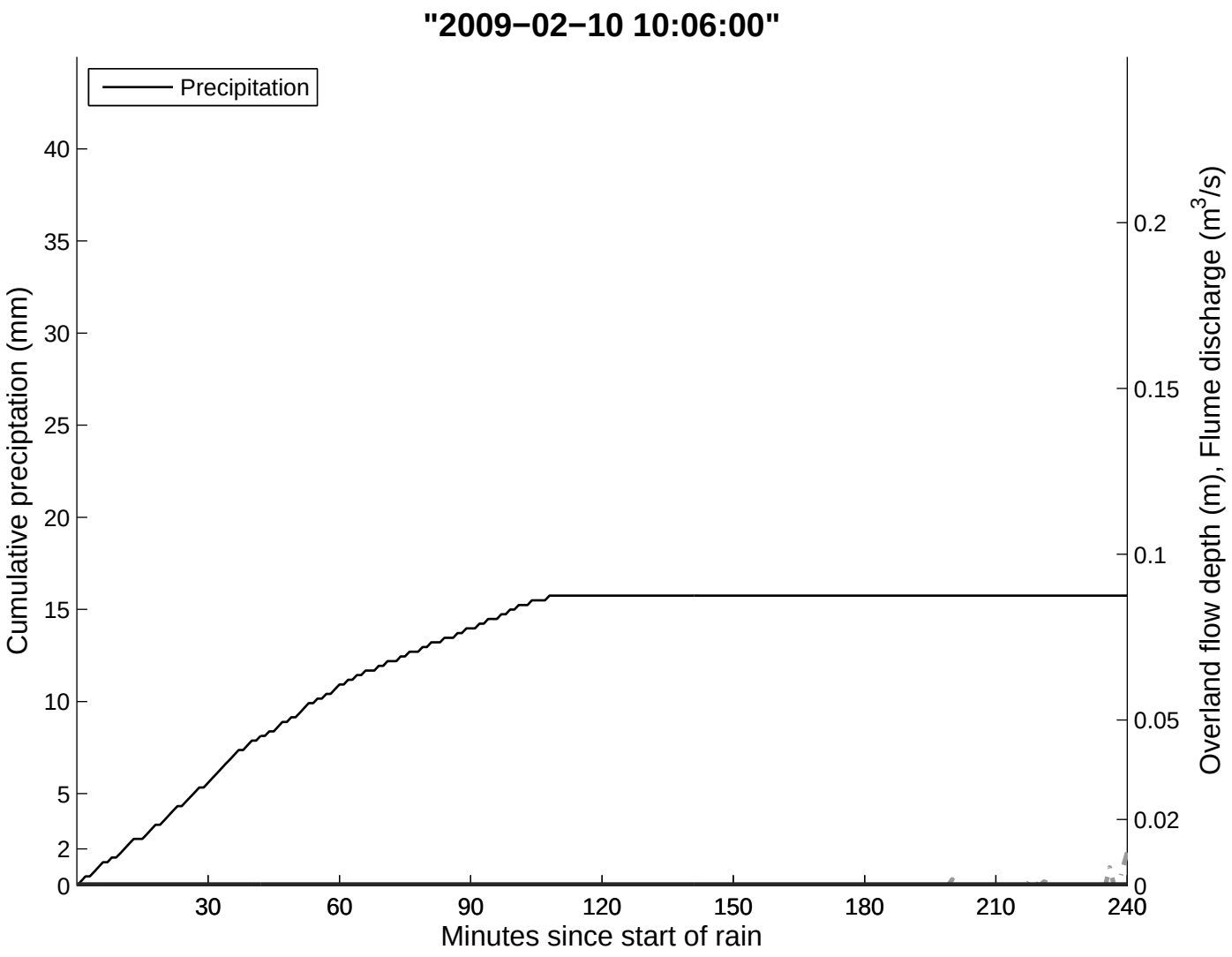

"2008−08−26 14:52:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240

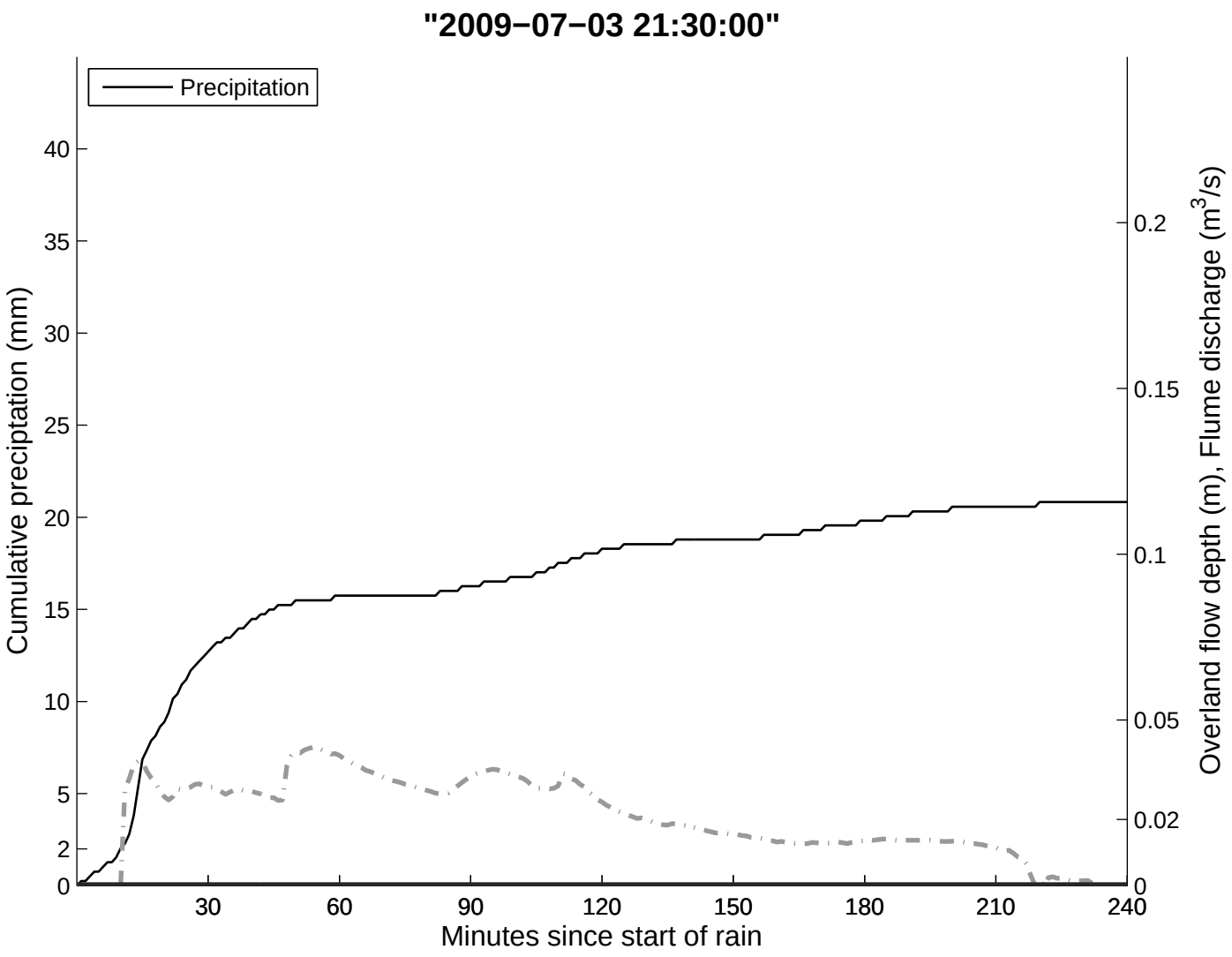

"2008−08−30 19:24:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240

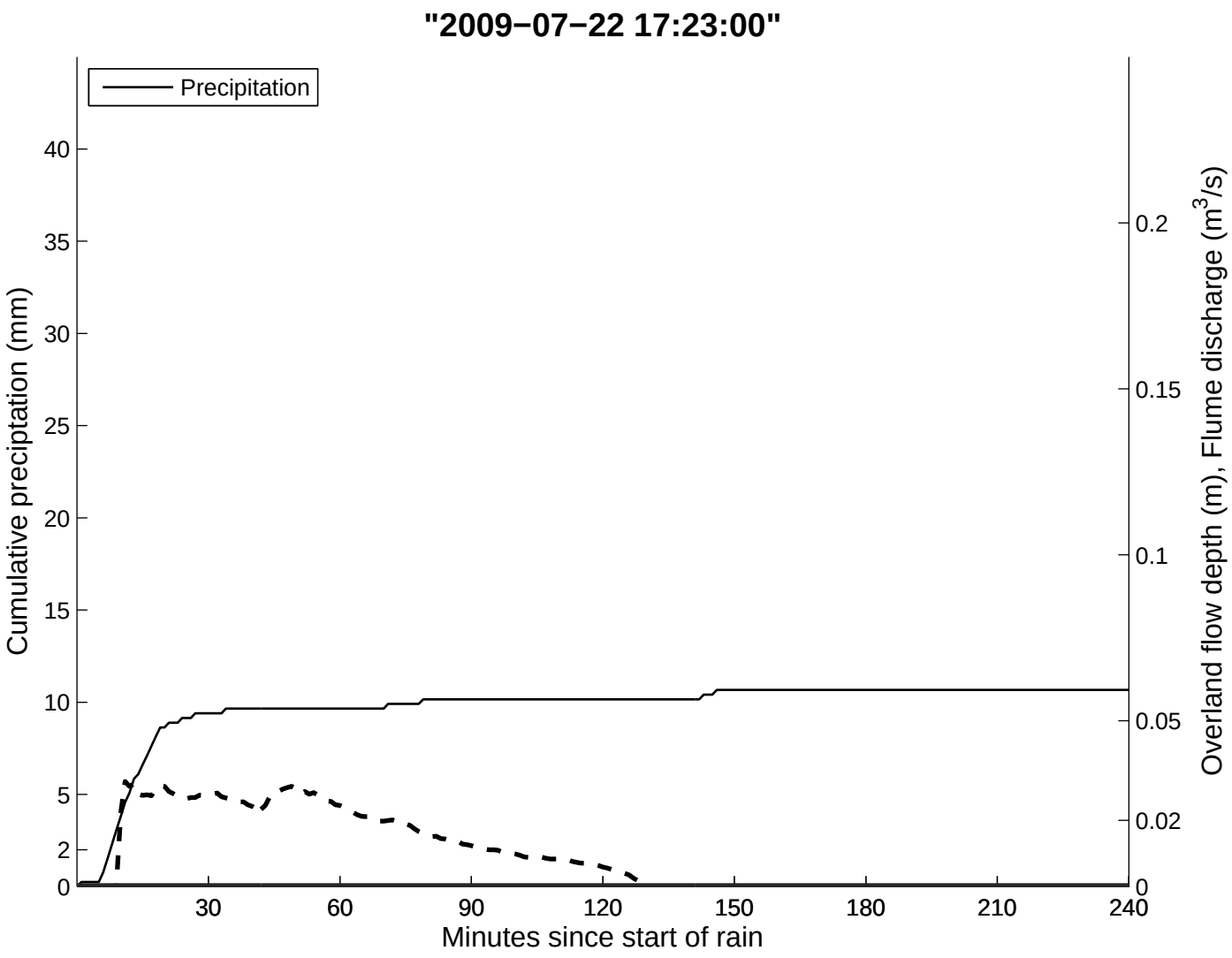

"2008−08−31 03:40:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240

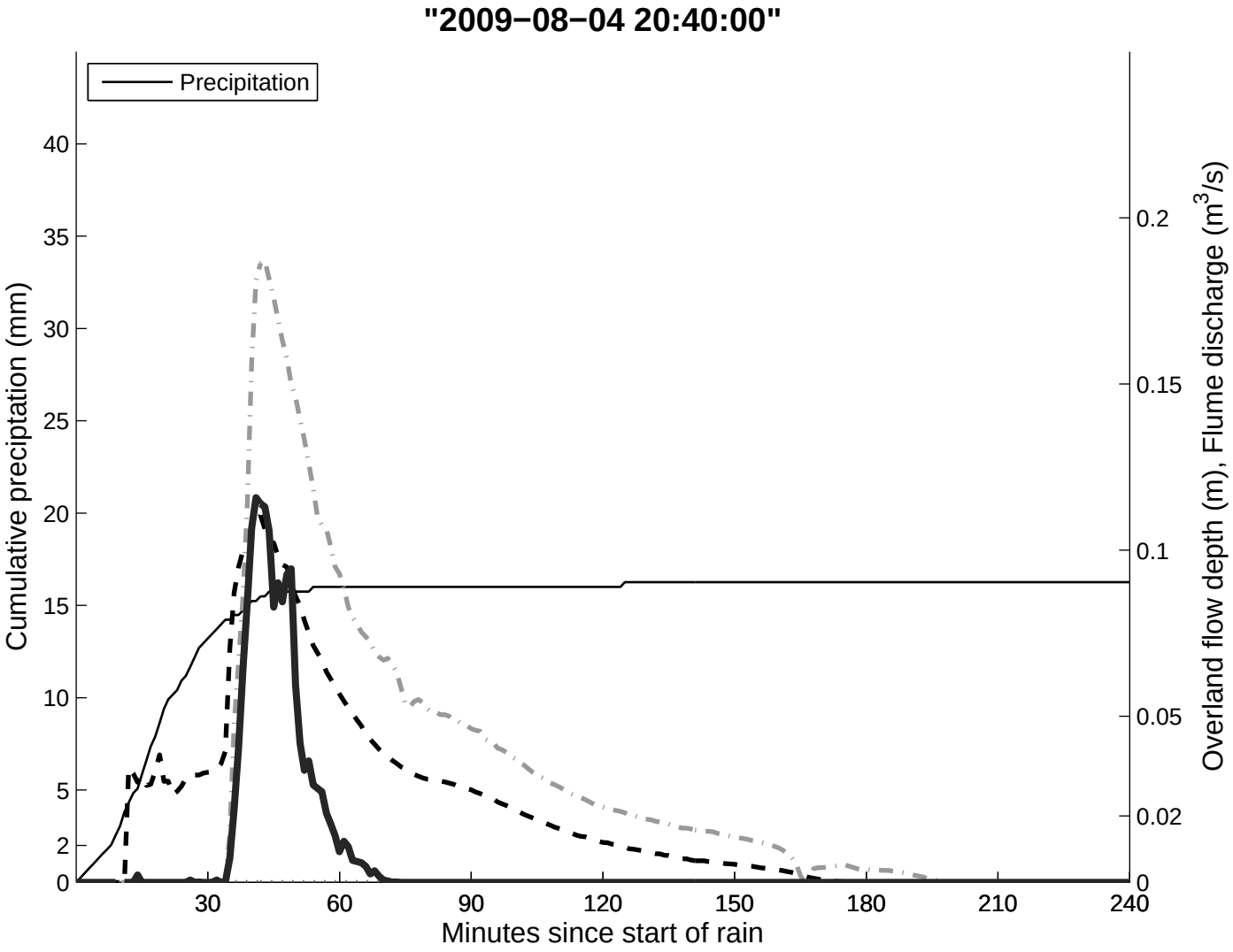

"2008−08−31 21:05:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240

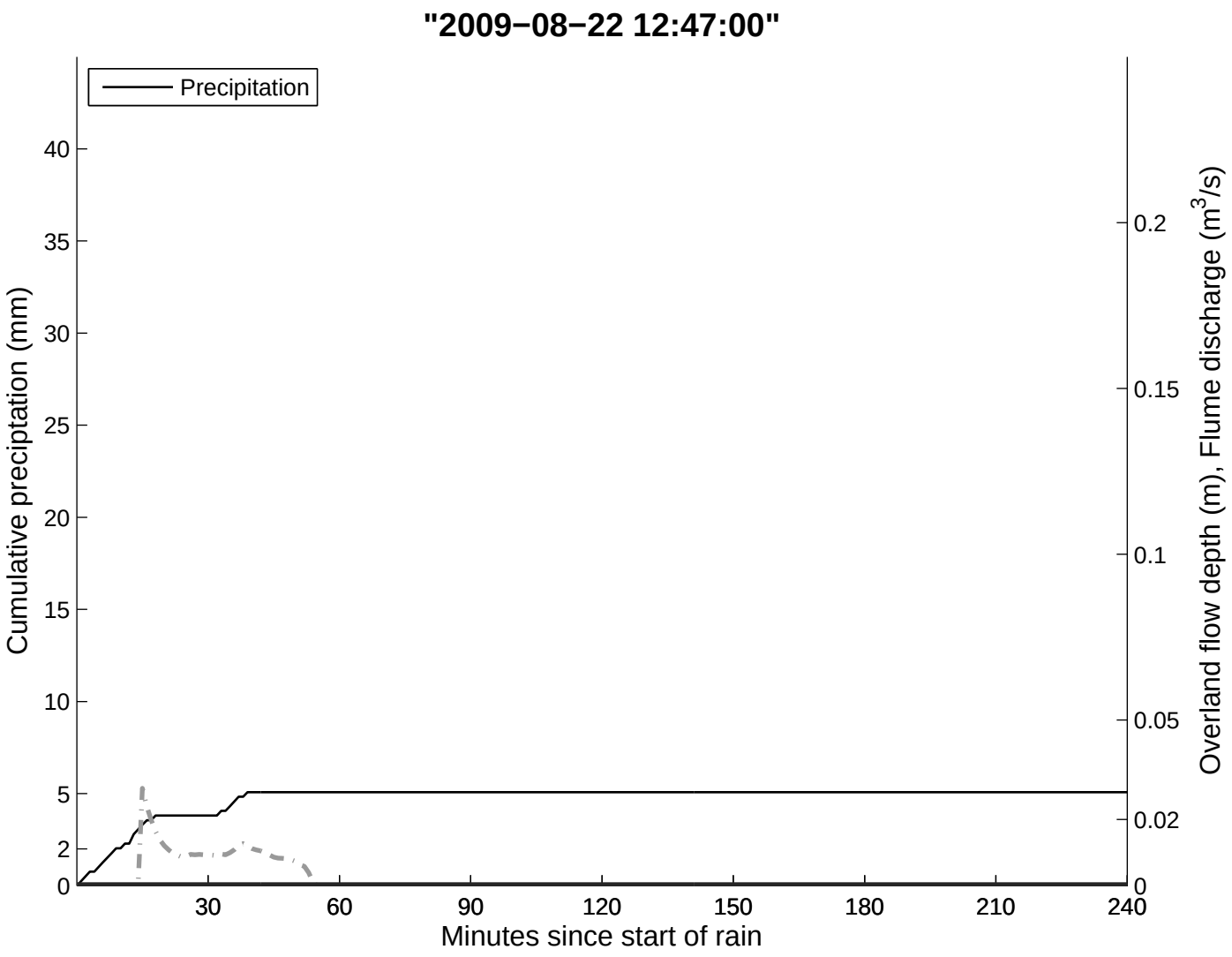

"2008−09−26 13:18:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240

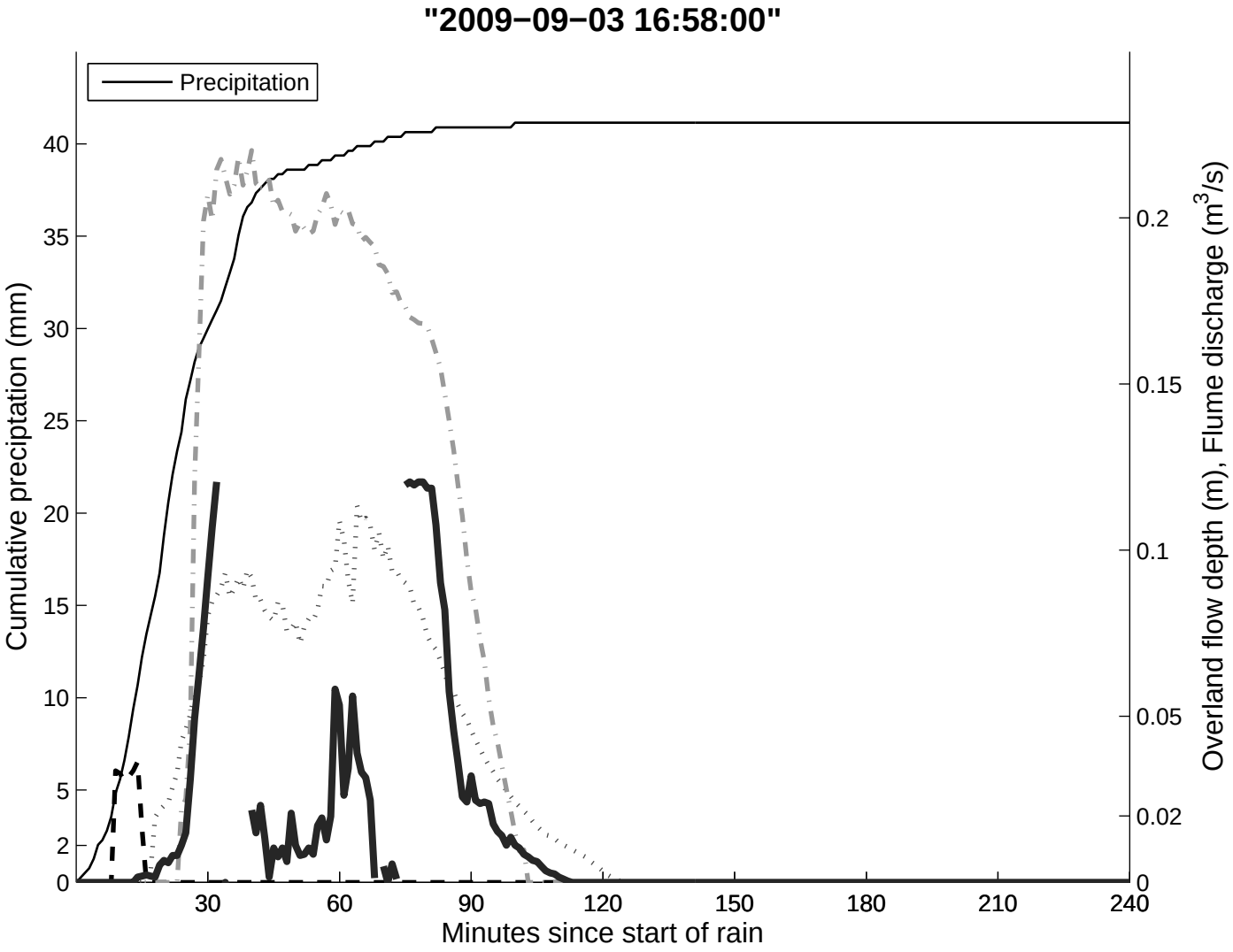

"2009−02−10 10:06:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240

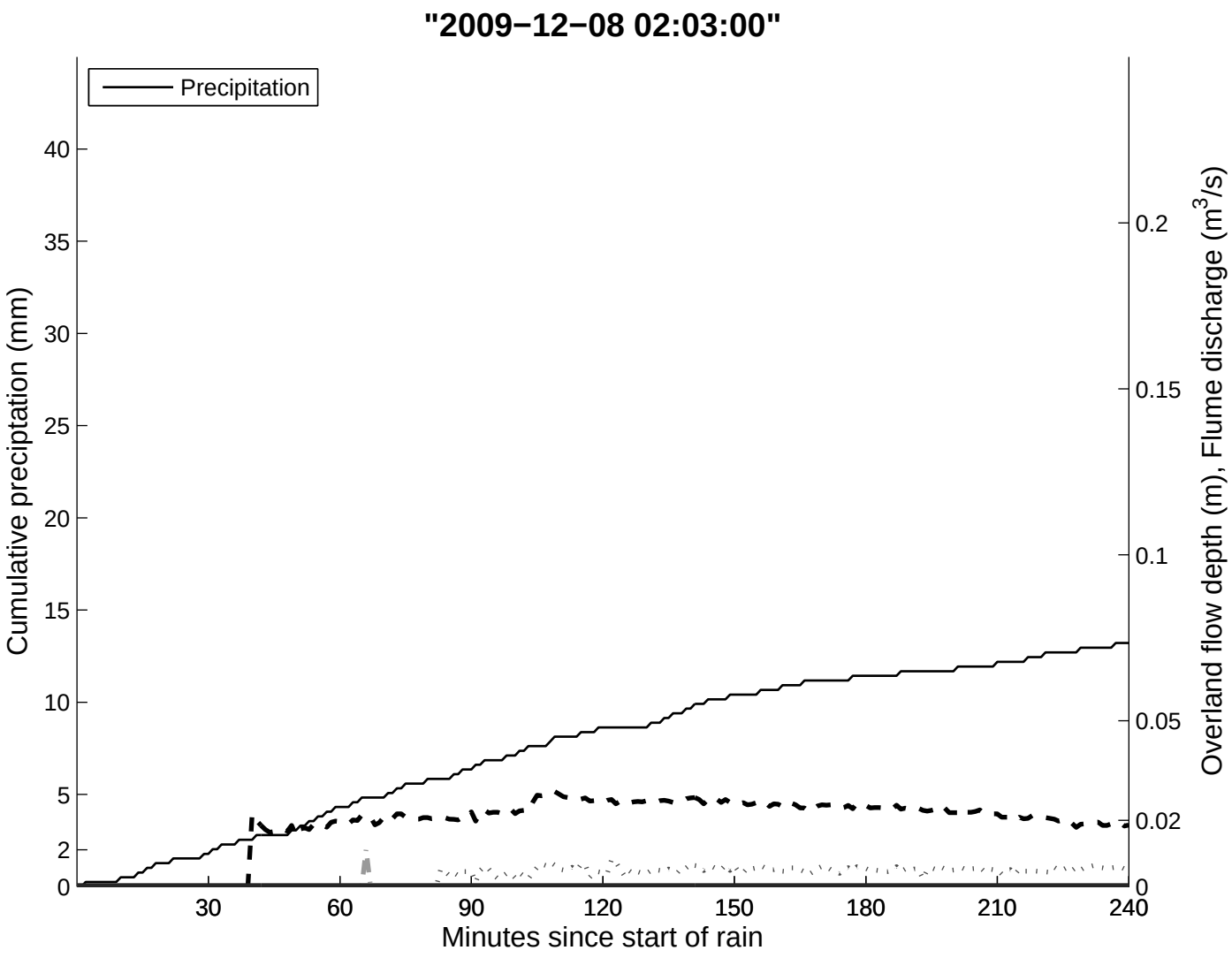

"2009−07−03 21:30:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240

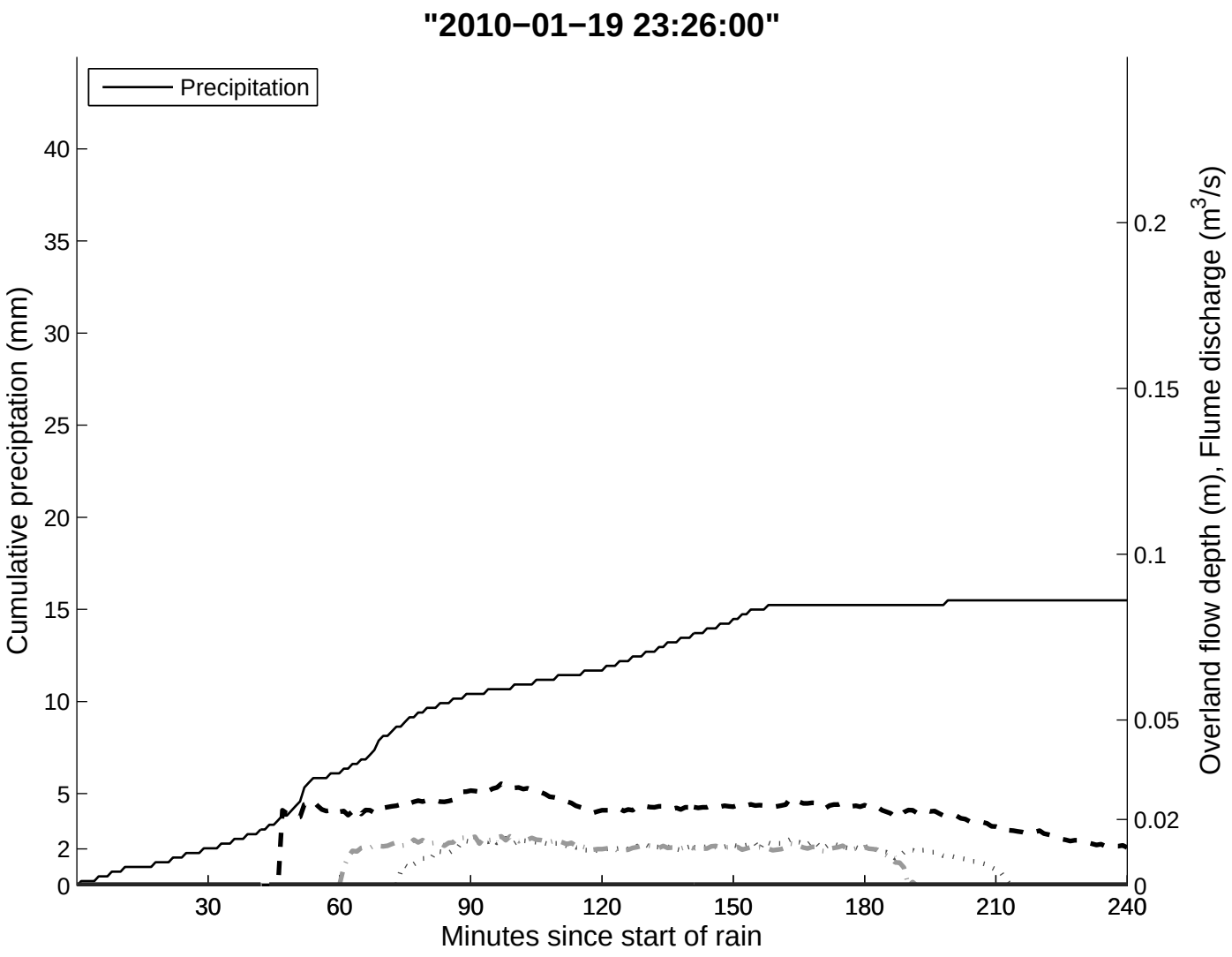

"2009−07−22 17:23:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240

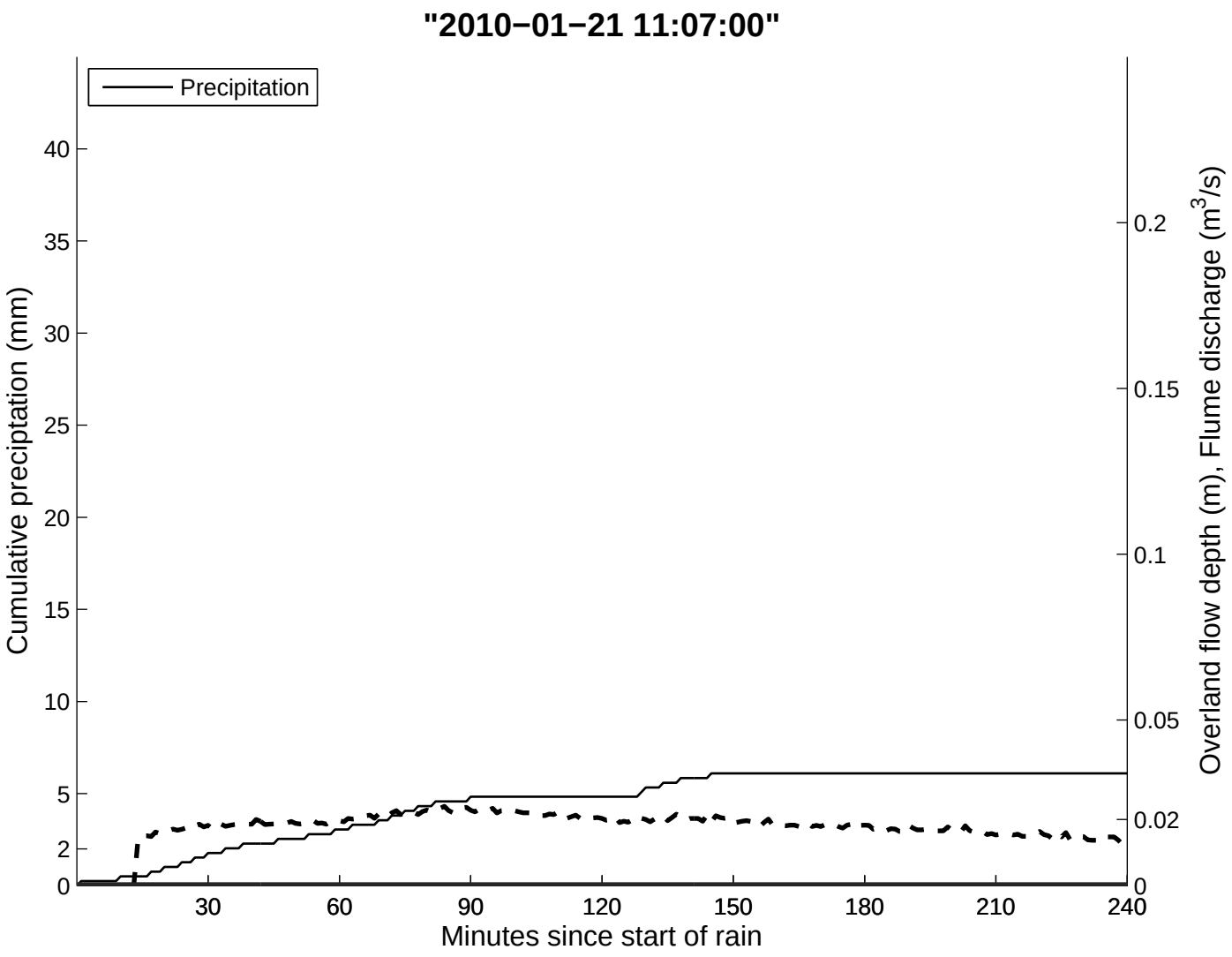

"2009−08−04 20:40:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240

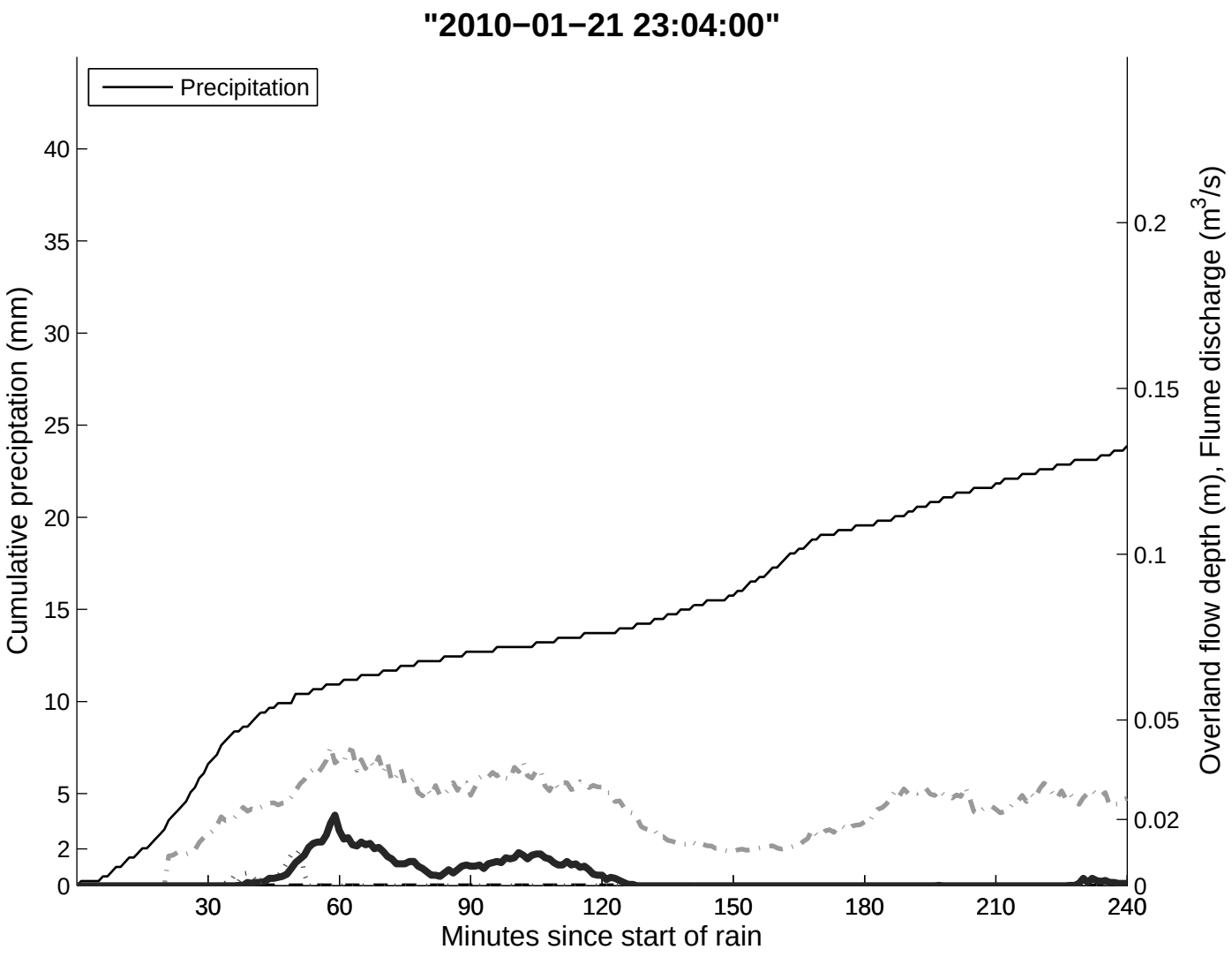

"2009−08−22 12:47:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240

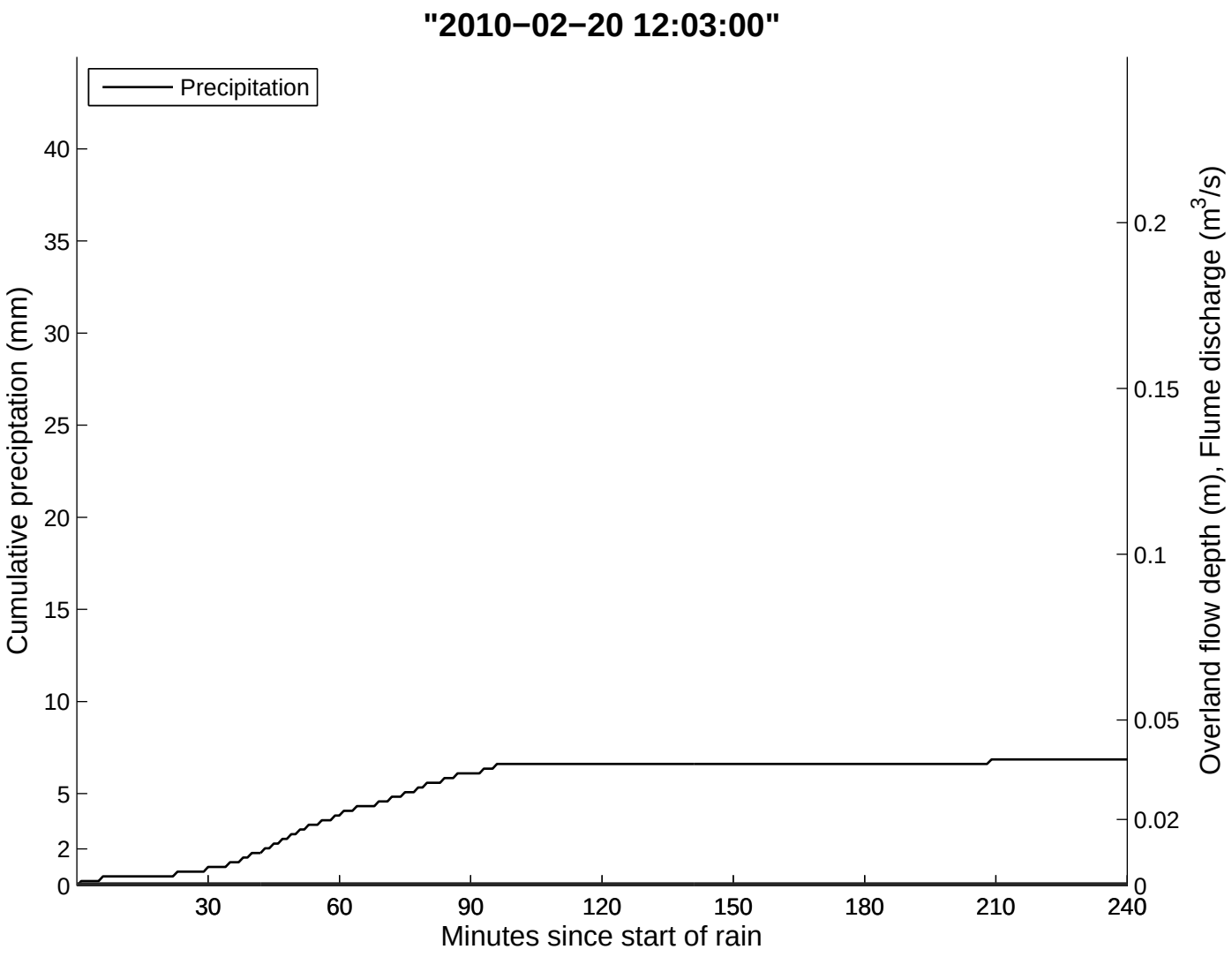

"2009−09−03 16:58:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240

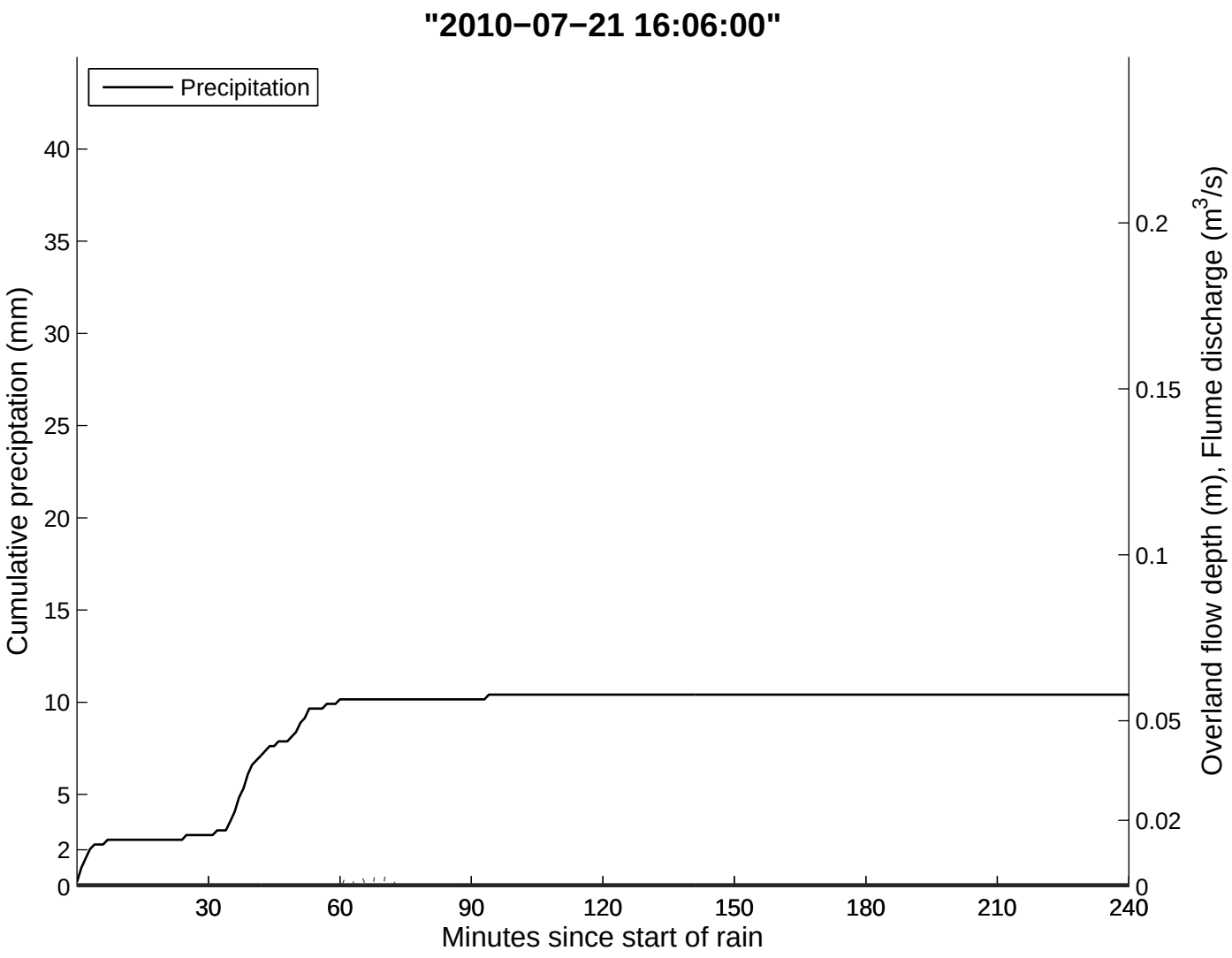

"2009−12−08 02:03:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240

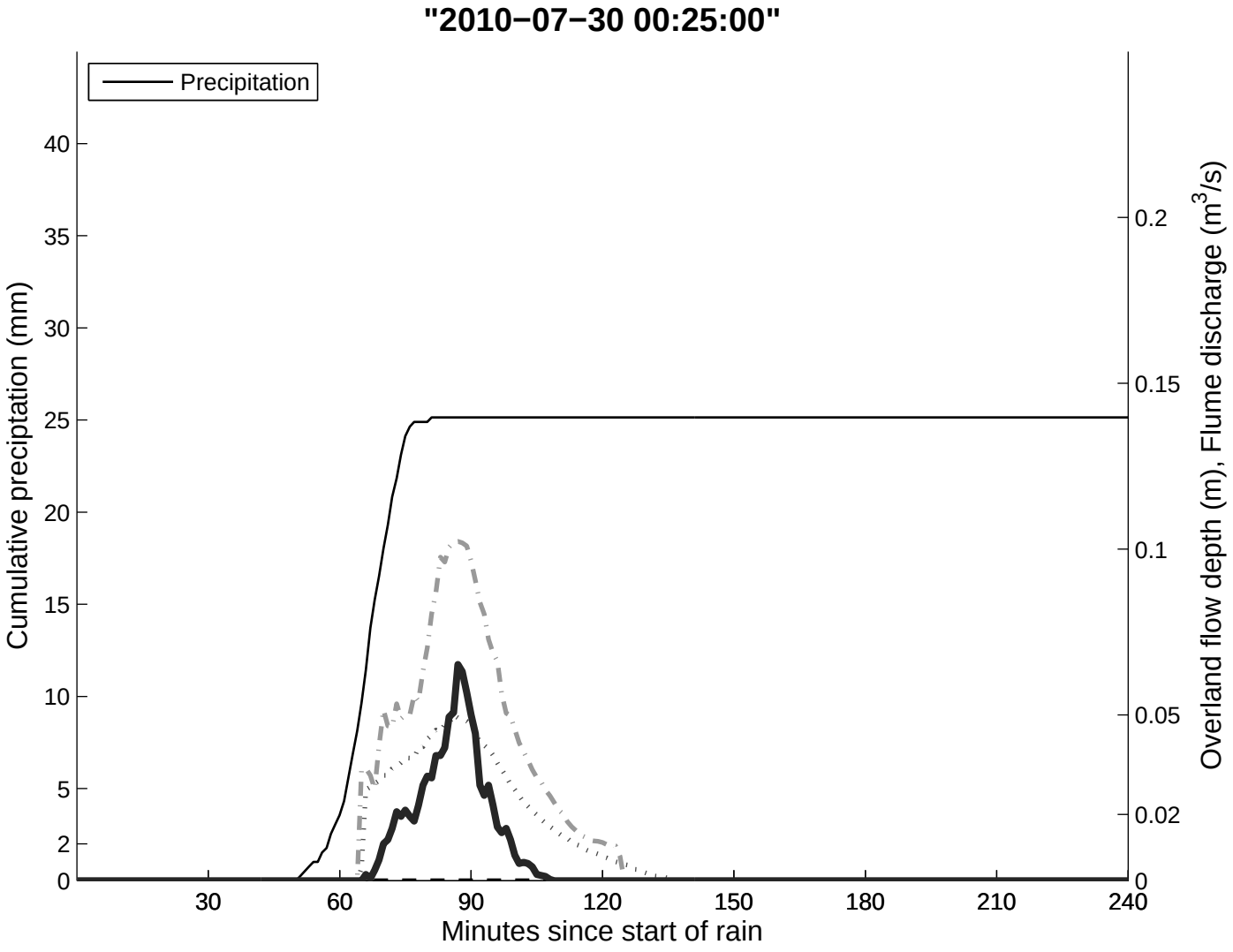

"2010−01−19 23:26:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240

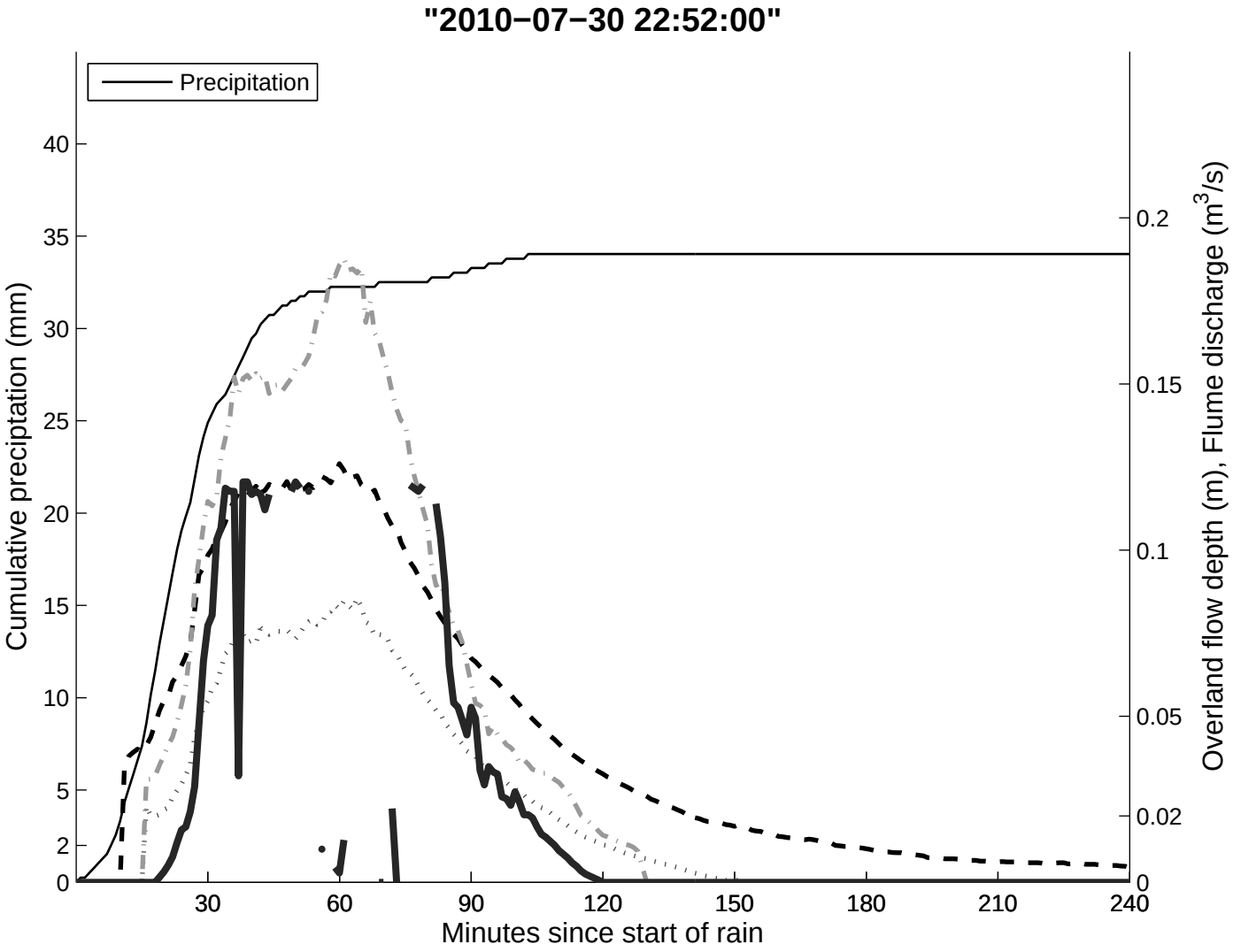

"2010−01−21 11:07:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240

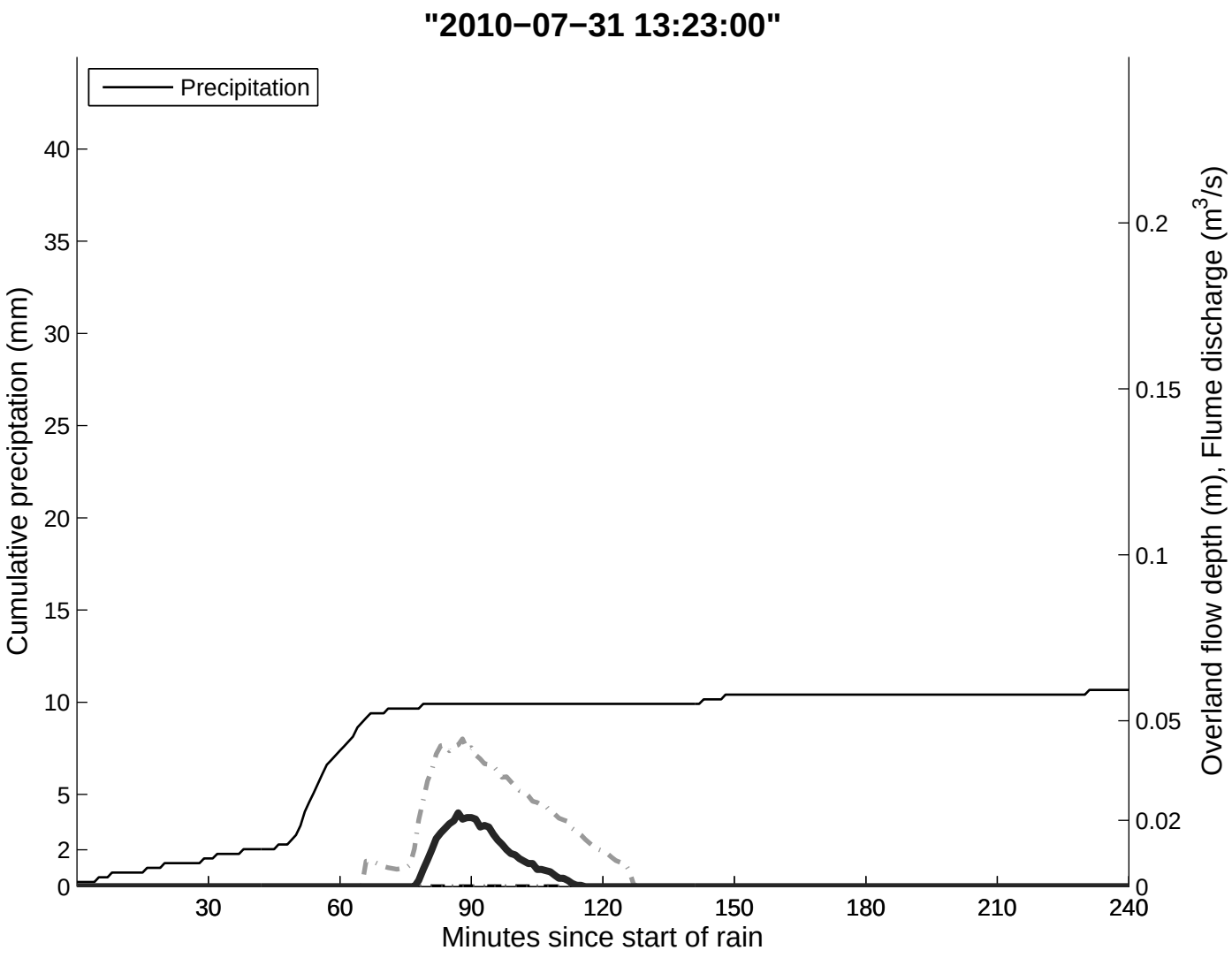

"2010−01−21 23:04:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240

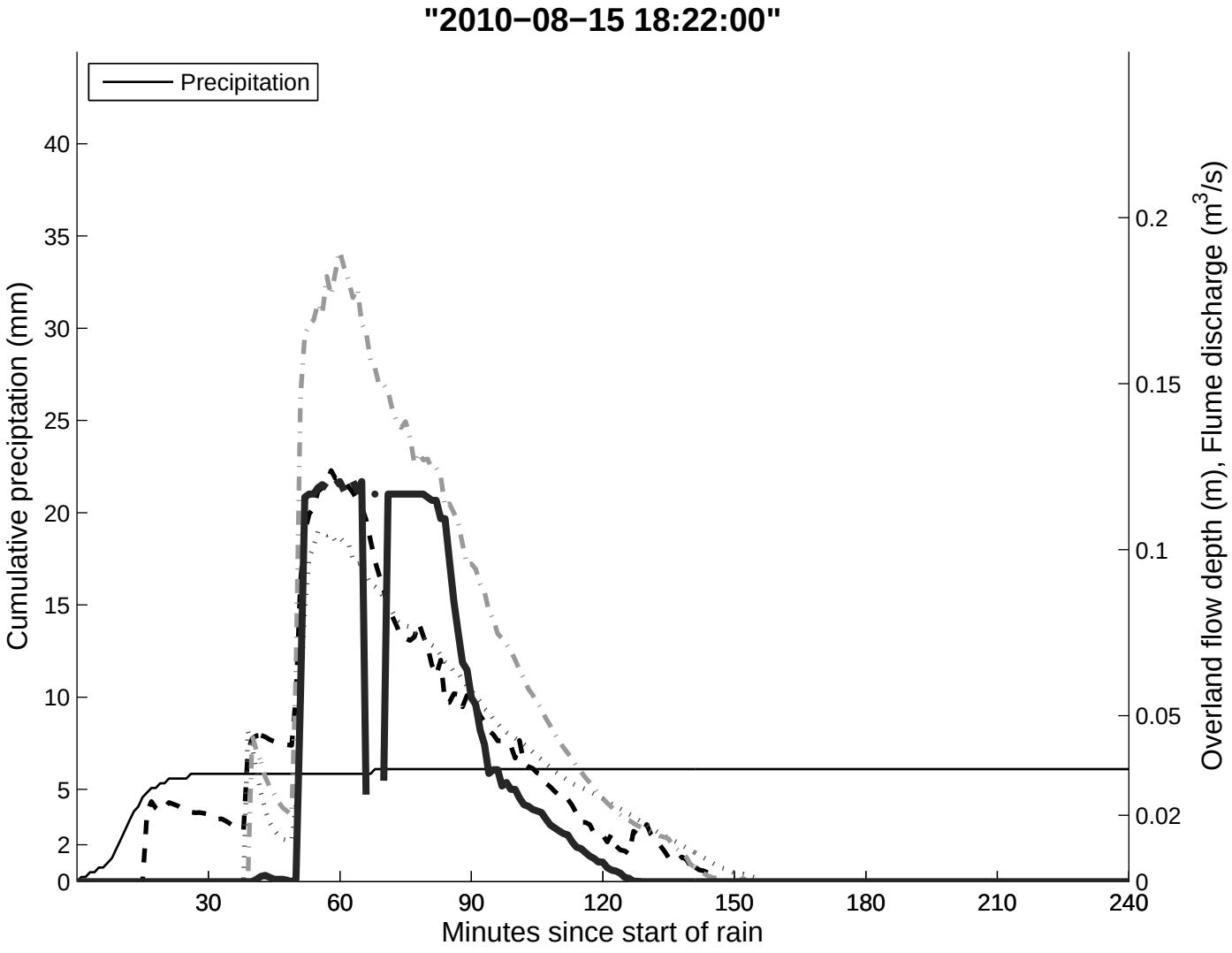

"2010−02−20 12:03:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240

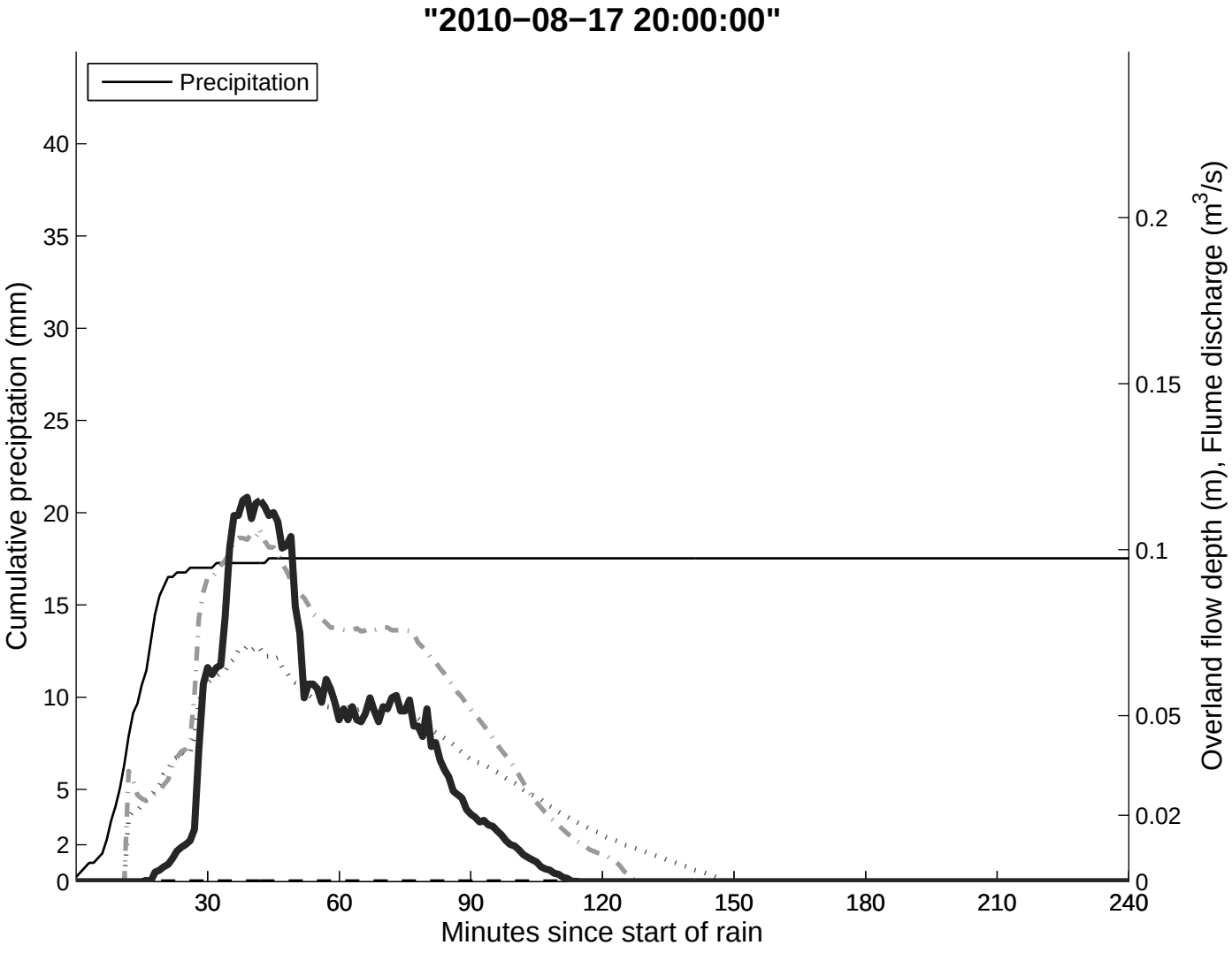

"2010−07−21 16:06:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240

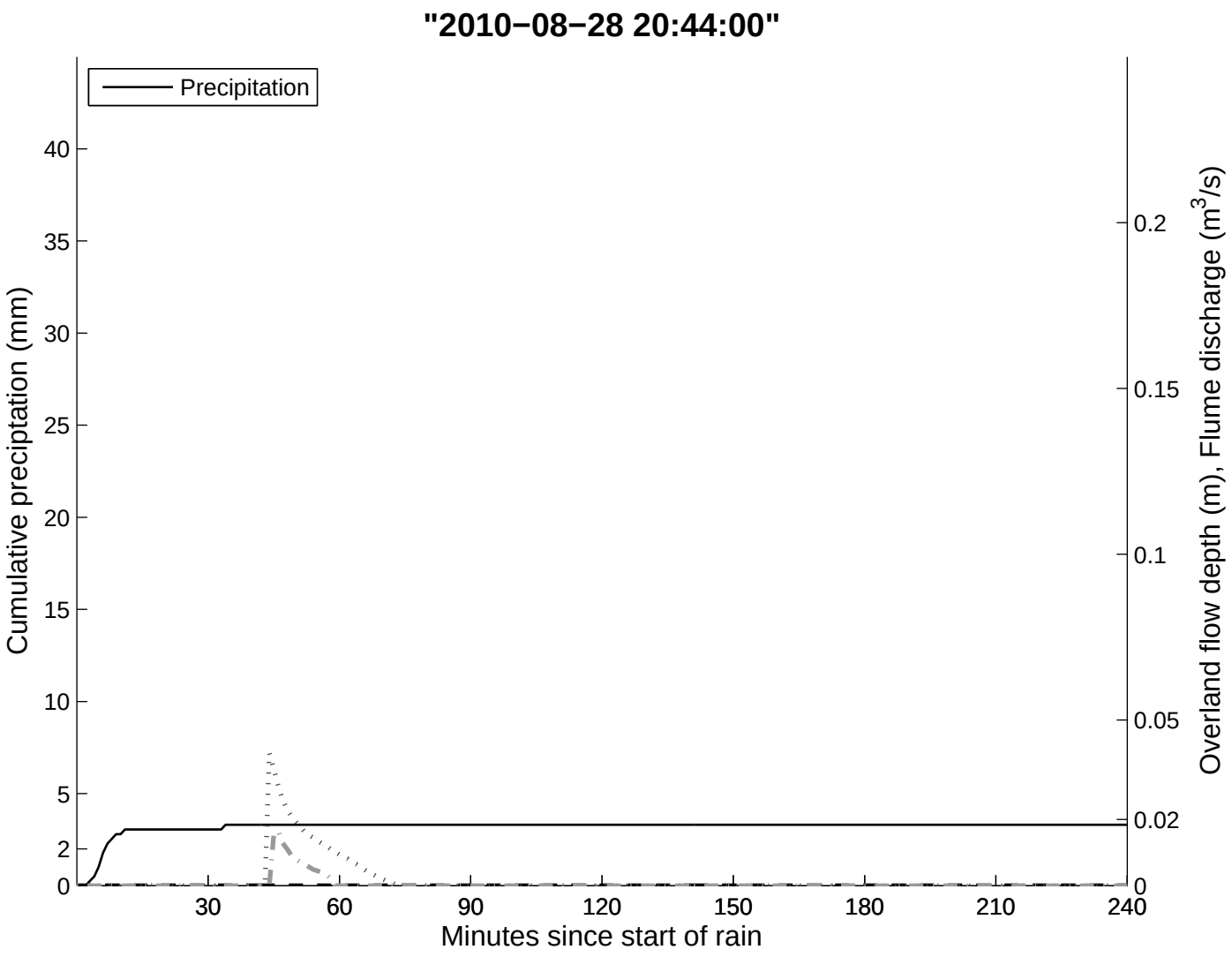

"2010−07−30 00:25:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240

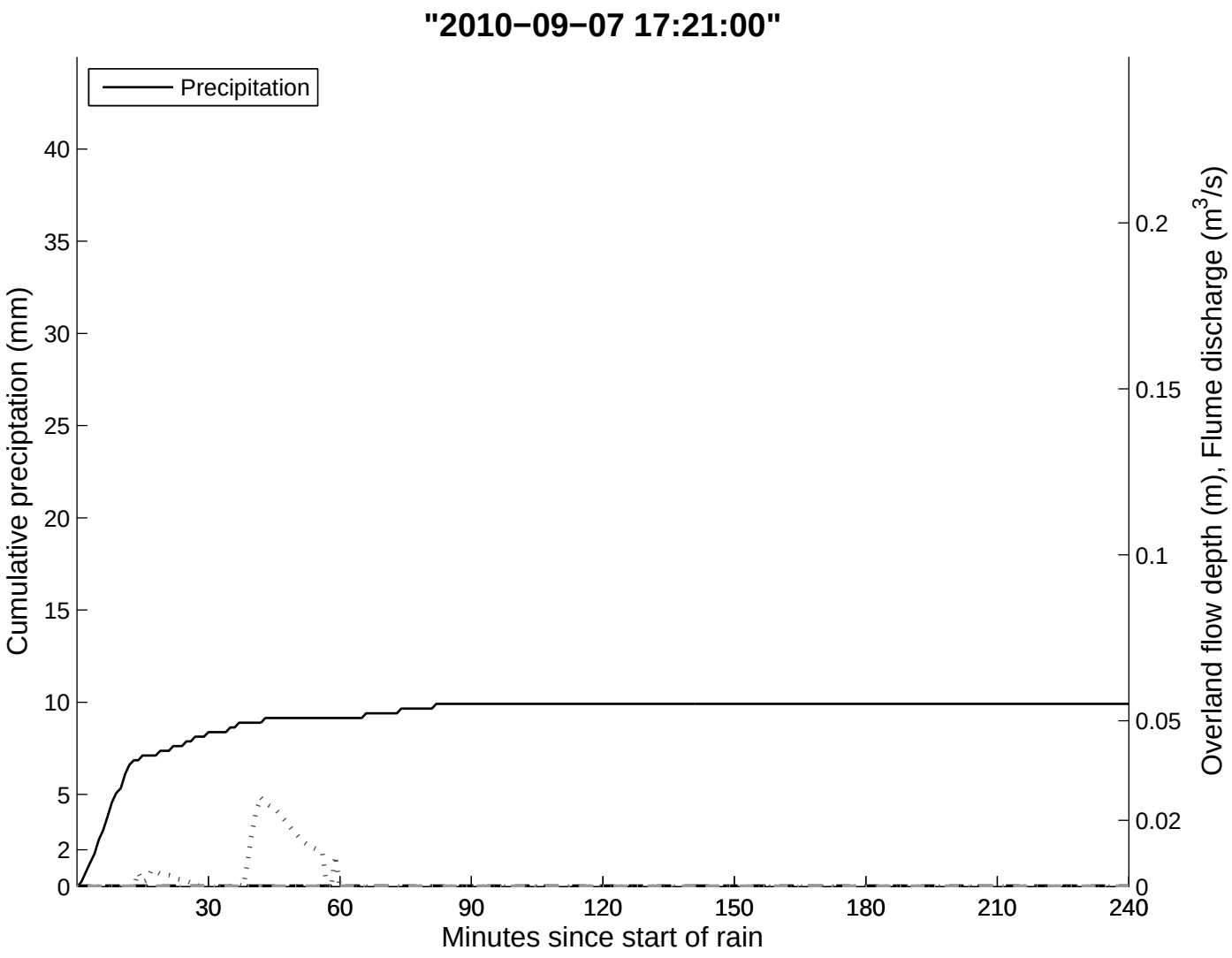

"2010−07−30 22:52:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240

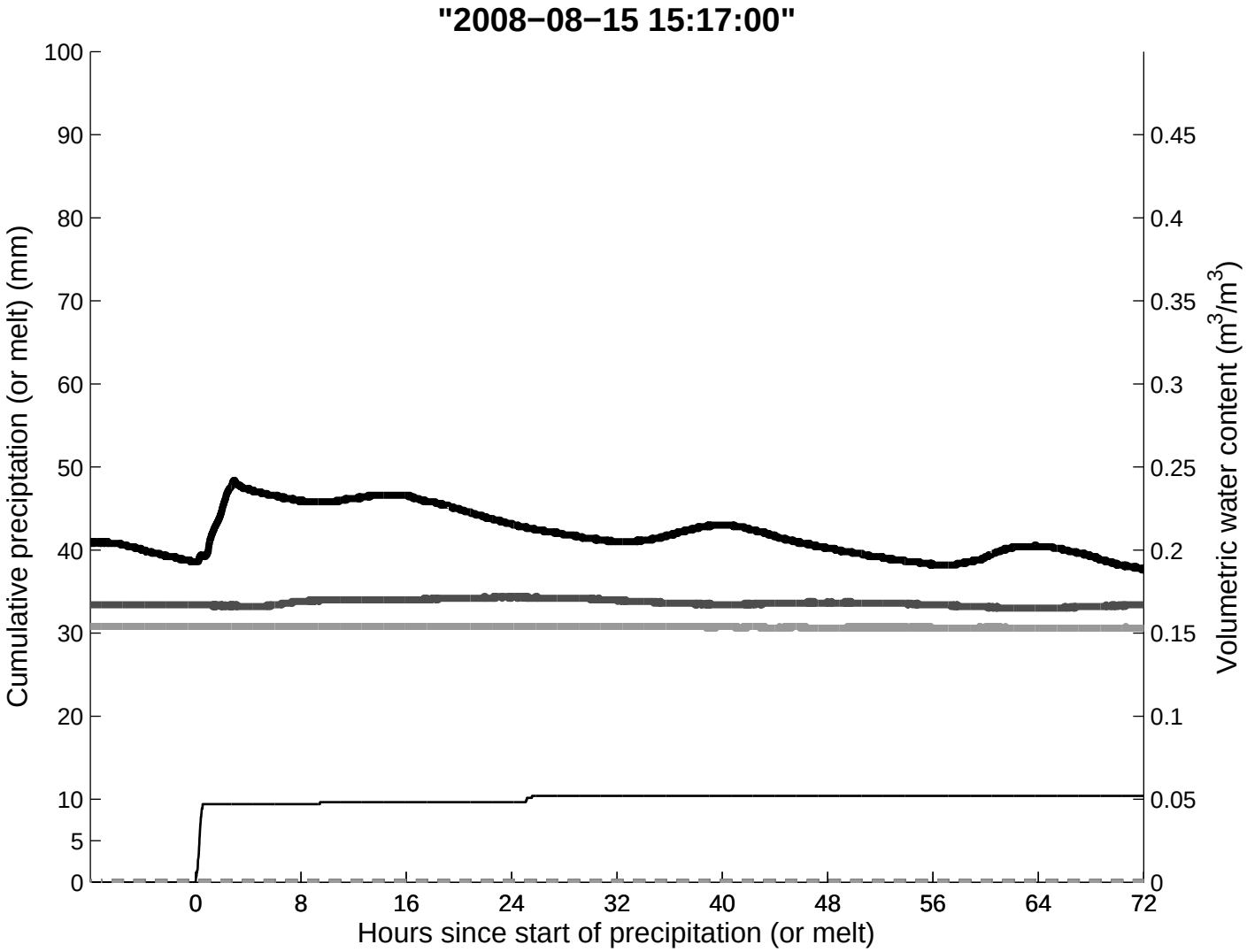

"2010−07−31 13:23:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240

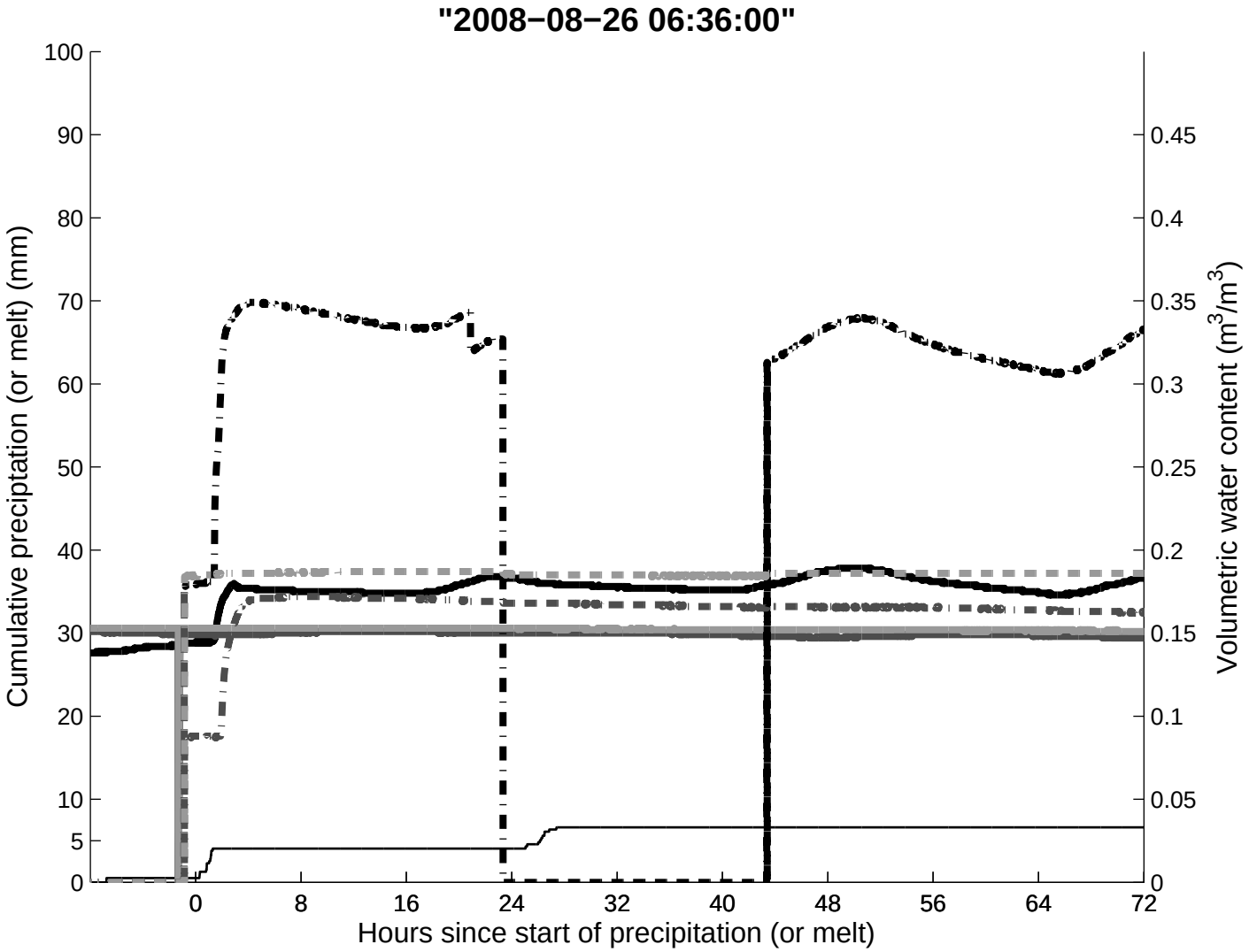

"2010−08−15 18:22:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240

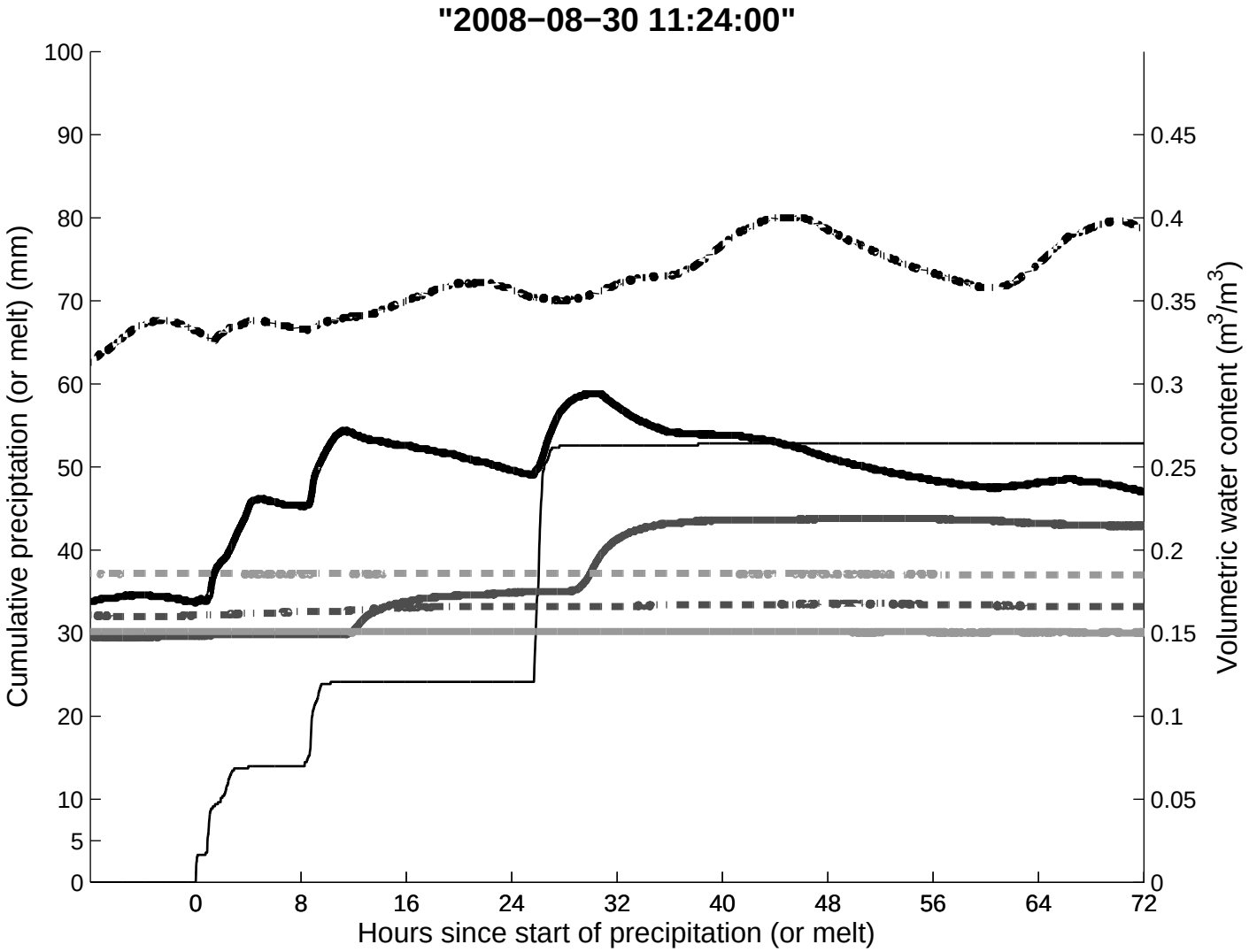

"2010−08−17 20:00:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240

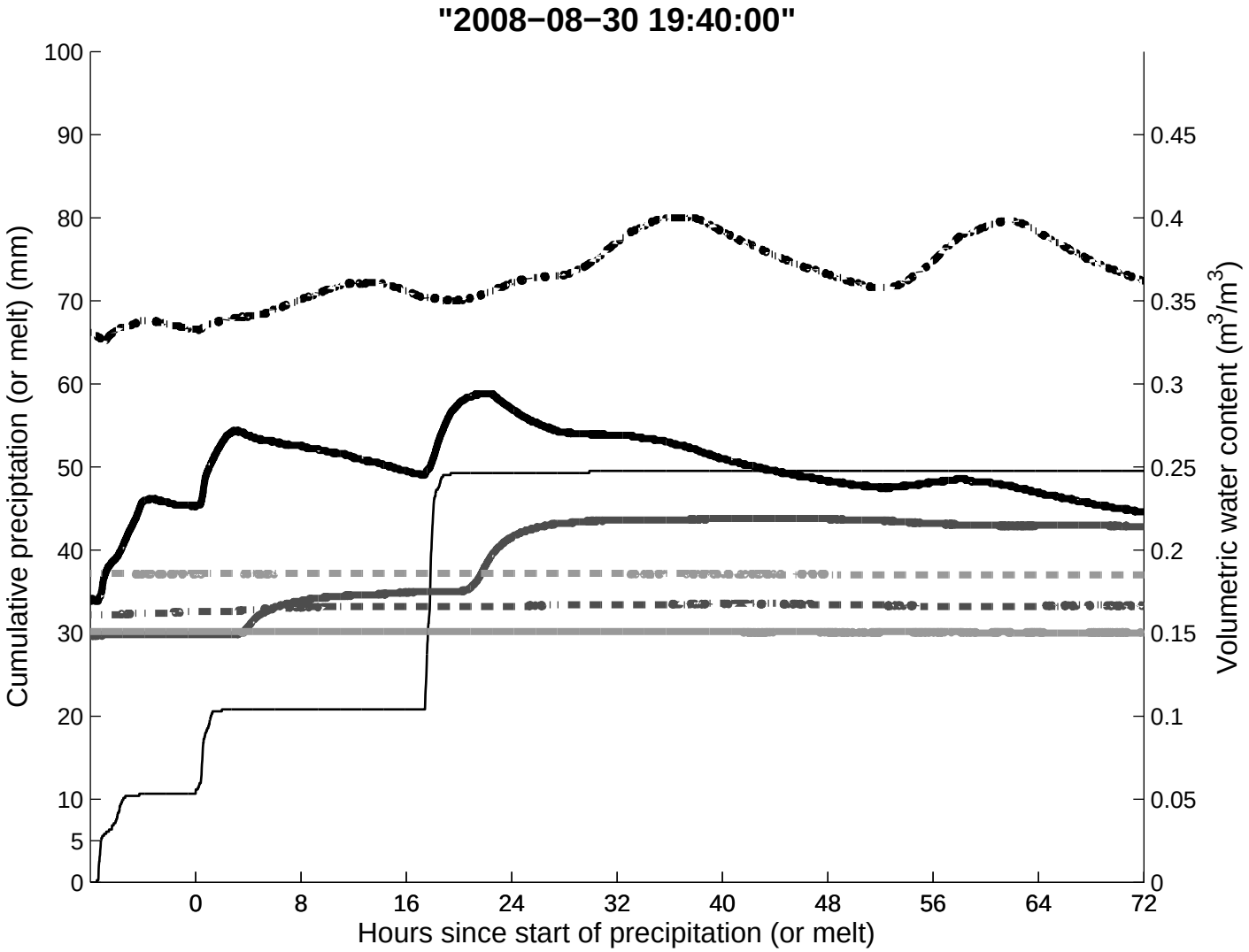

"2010−08−28 20:44:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240


"2010−09−07 17:21:00"
Precipitation
Cumulative preciptation (mm)
Overland flow depth (m), Flume discharge (m3/s)
Minutes since start of rain
0
2
5
10
15
20
25
30
35
40
0
0.02
0.05
0.1
0.15
0.2
30
60
90
120
150
180
210
240


"2008−08−15 15:17:00"
Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
100
90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
8
16
24
32
40
48
56
64
72


"2008−08−26 06:36:00"
Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
100
90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
8
16
24
32
40
48
56
64
72


"2008−08−30 11:24:00"
Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
100
90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
8
16
24
32
40
48
56
64
72


"2008−08−30 19:40:00"
Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
100
90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
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0
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16
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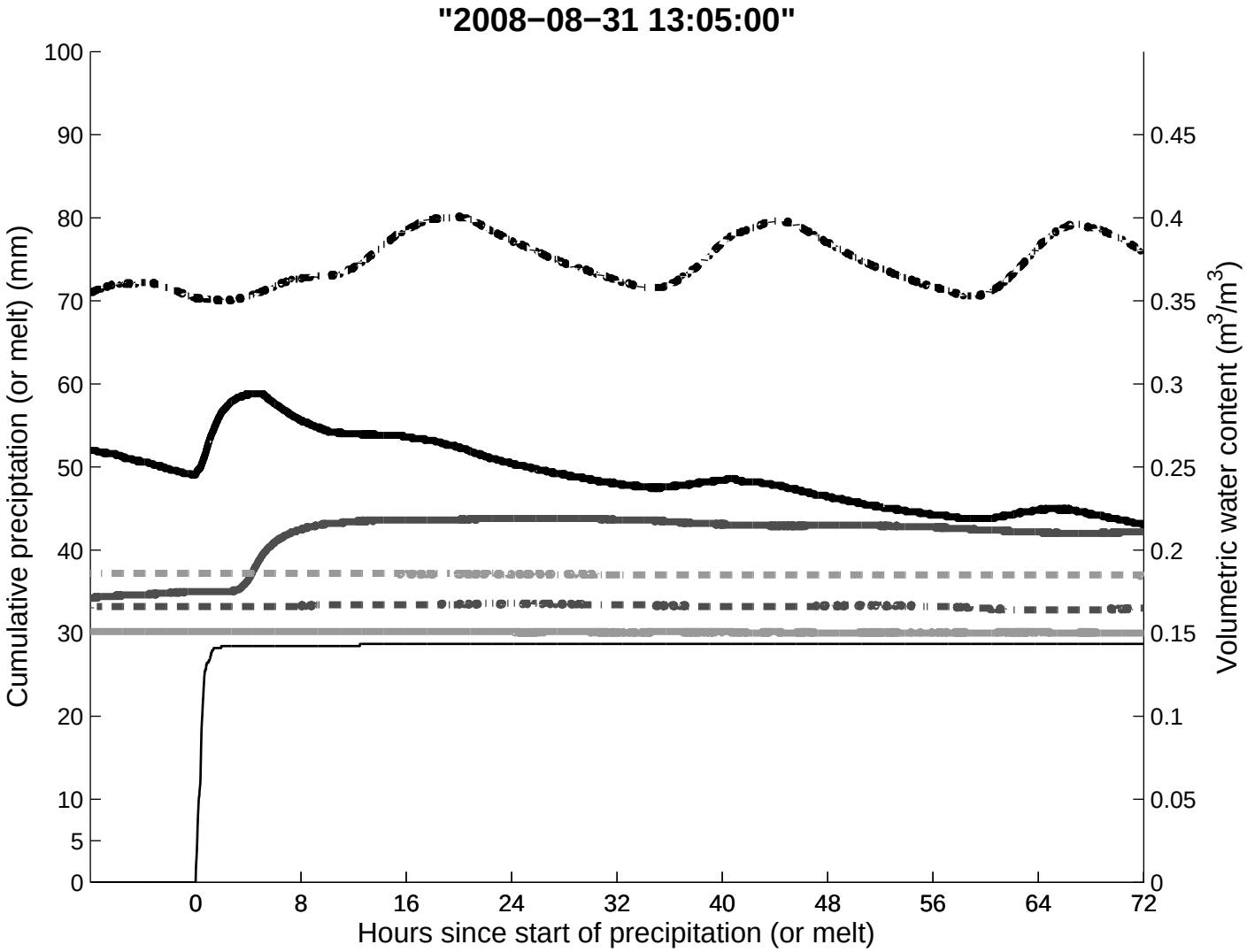
40
48
56
64
72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Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
100
90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
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16
24
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40
48
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64
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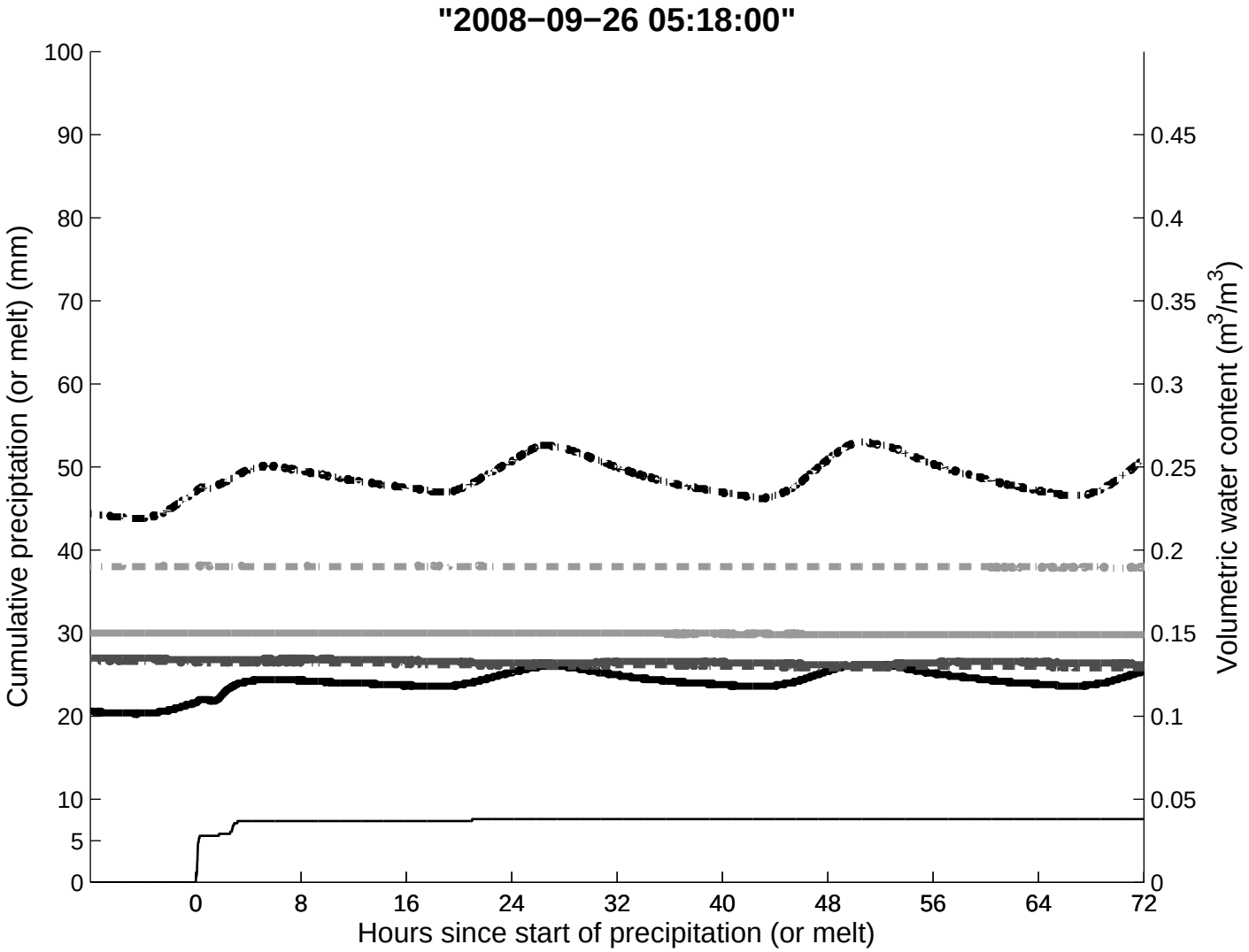
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Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
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90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
8
16
24
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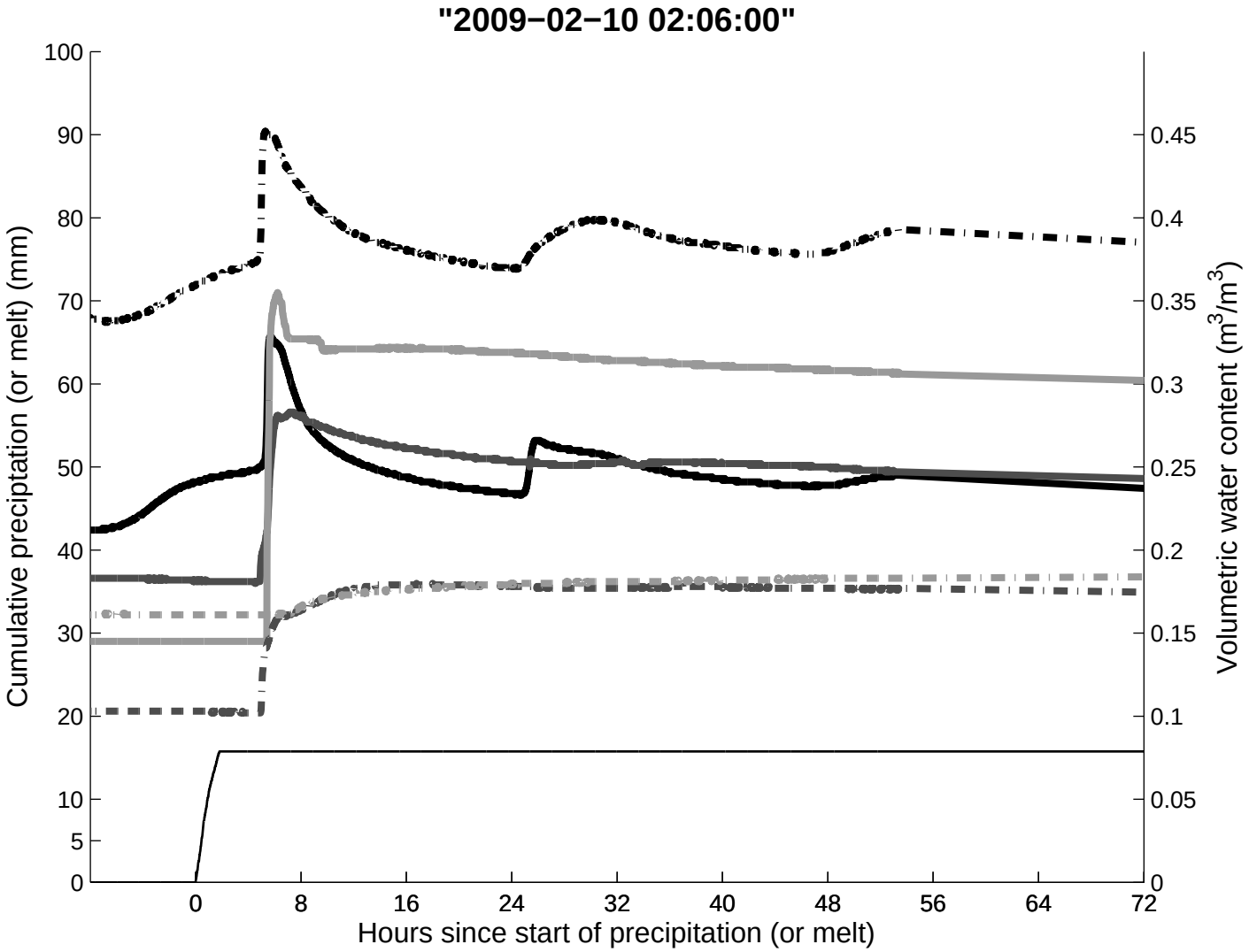
40
48
56
64
72


"2009−02−10 02:06:00"
Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
100
90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
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16
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48
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64
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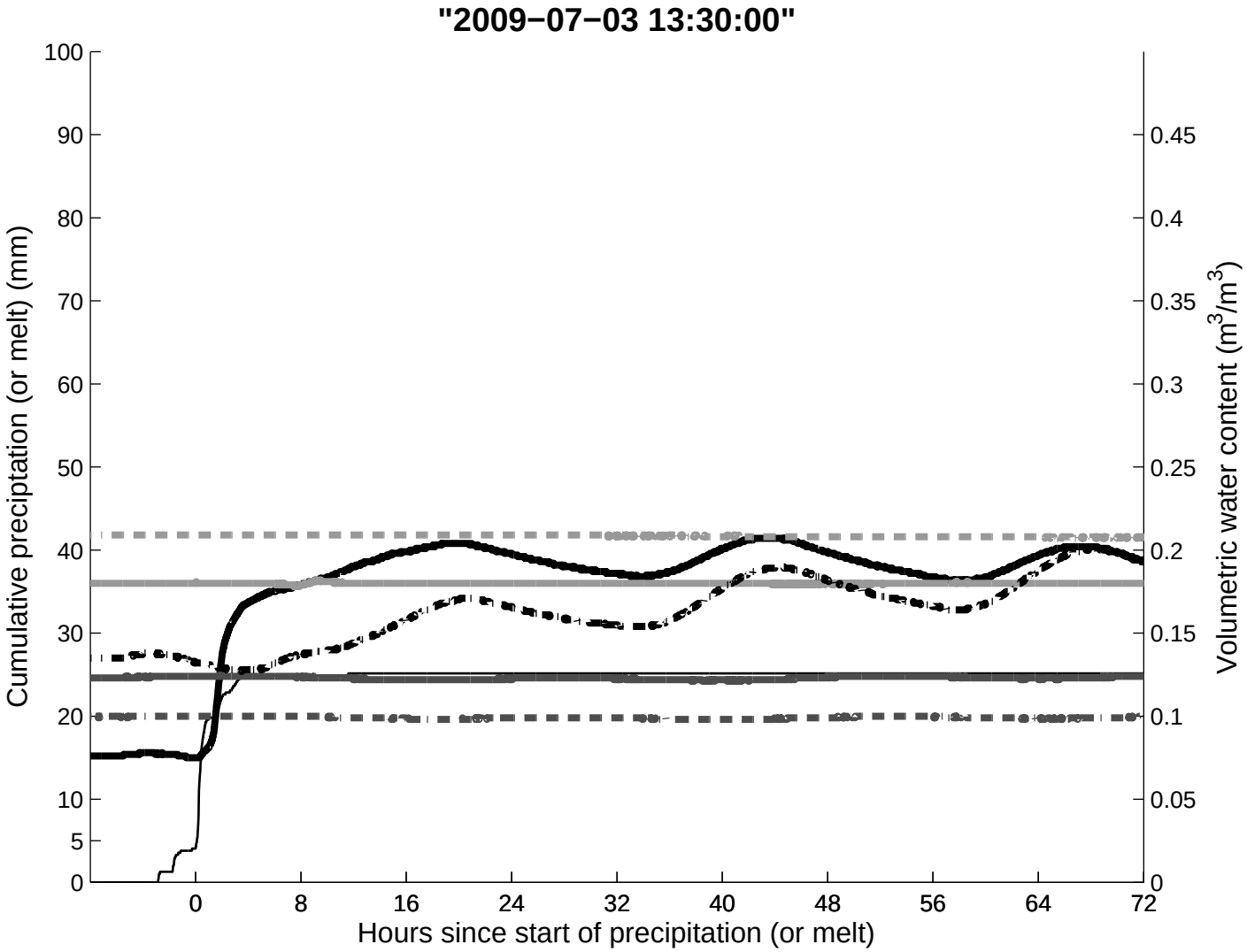
"2009−07−03 13:30:00"
Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
100
90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
8
16
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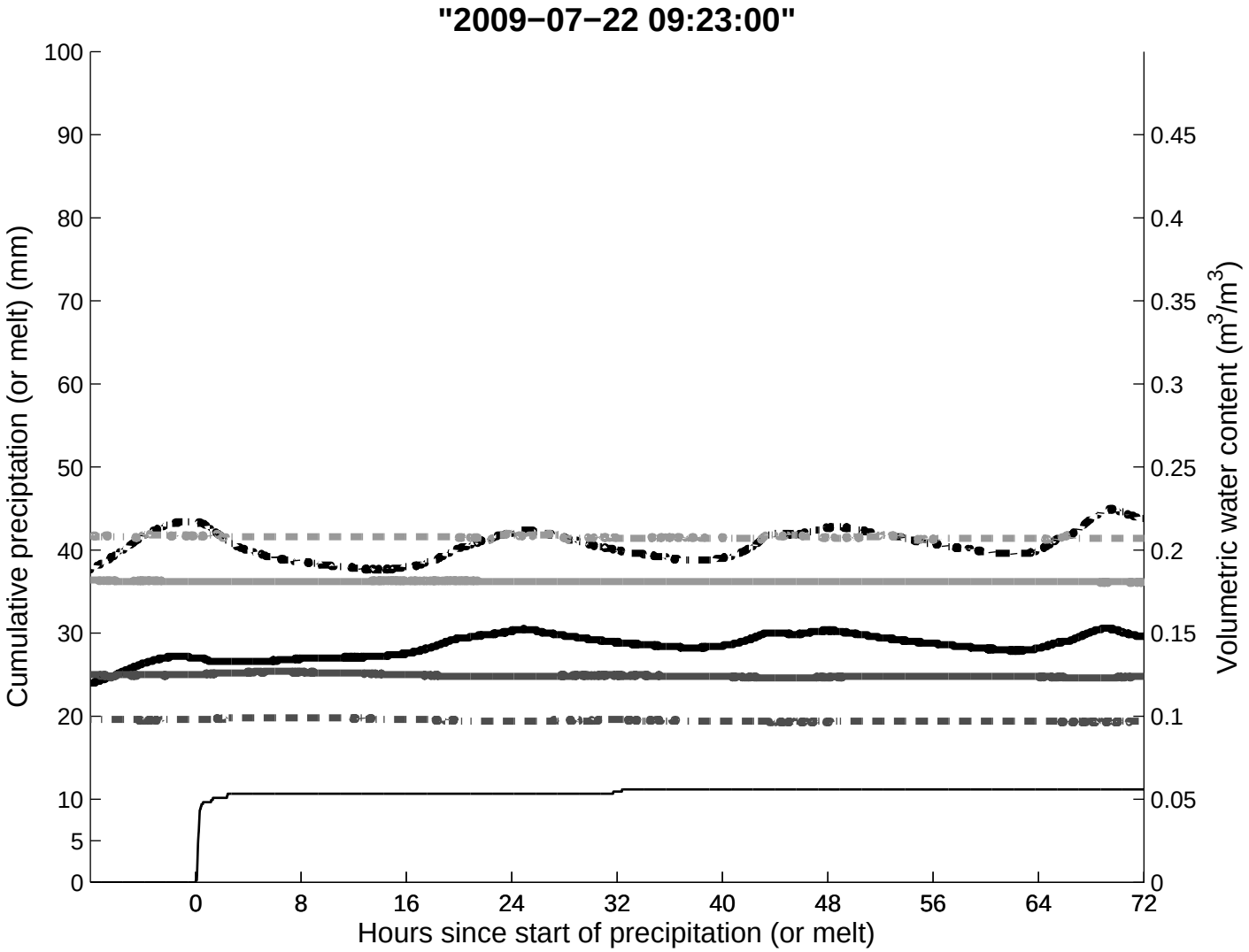
32
40
48
56
64
72


"2009−07−22 09:23:00"
Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
100
90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
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16
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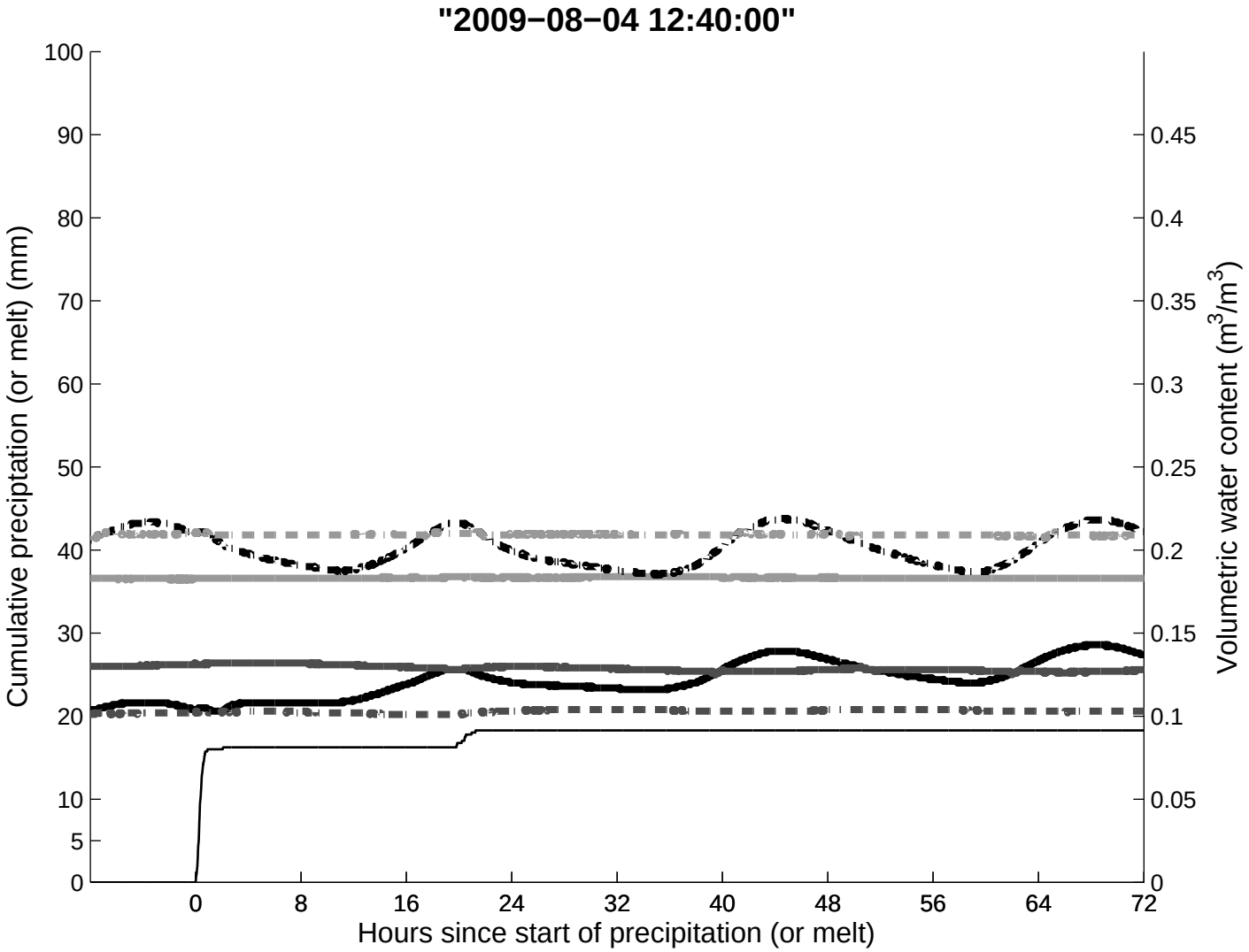
48
56
64
72


"2009−08−04 12:40:00"
Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
100
90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
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48
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64
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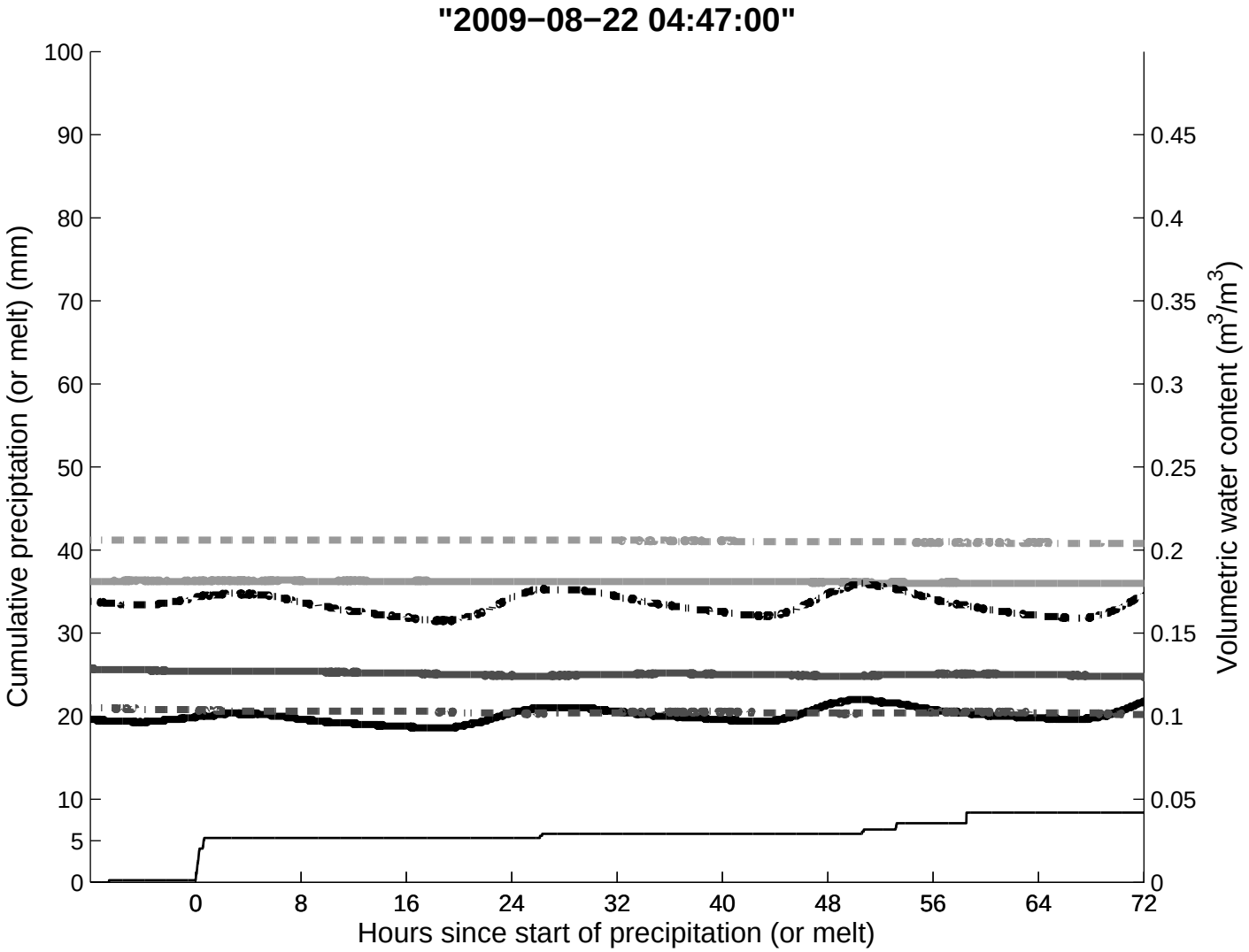
"2009−08−22 04:47:00"
Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
100
90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
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48
56
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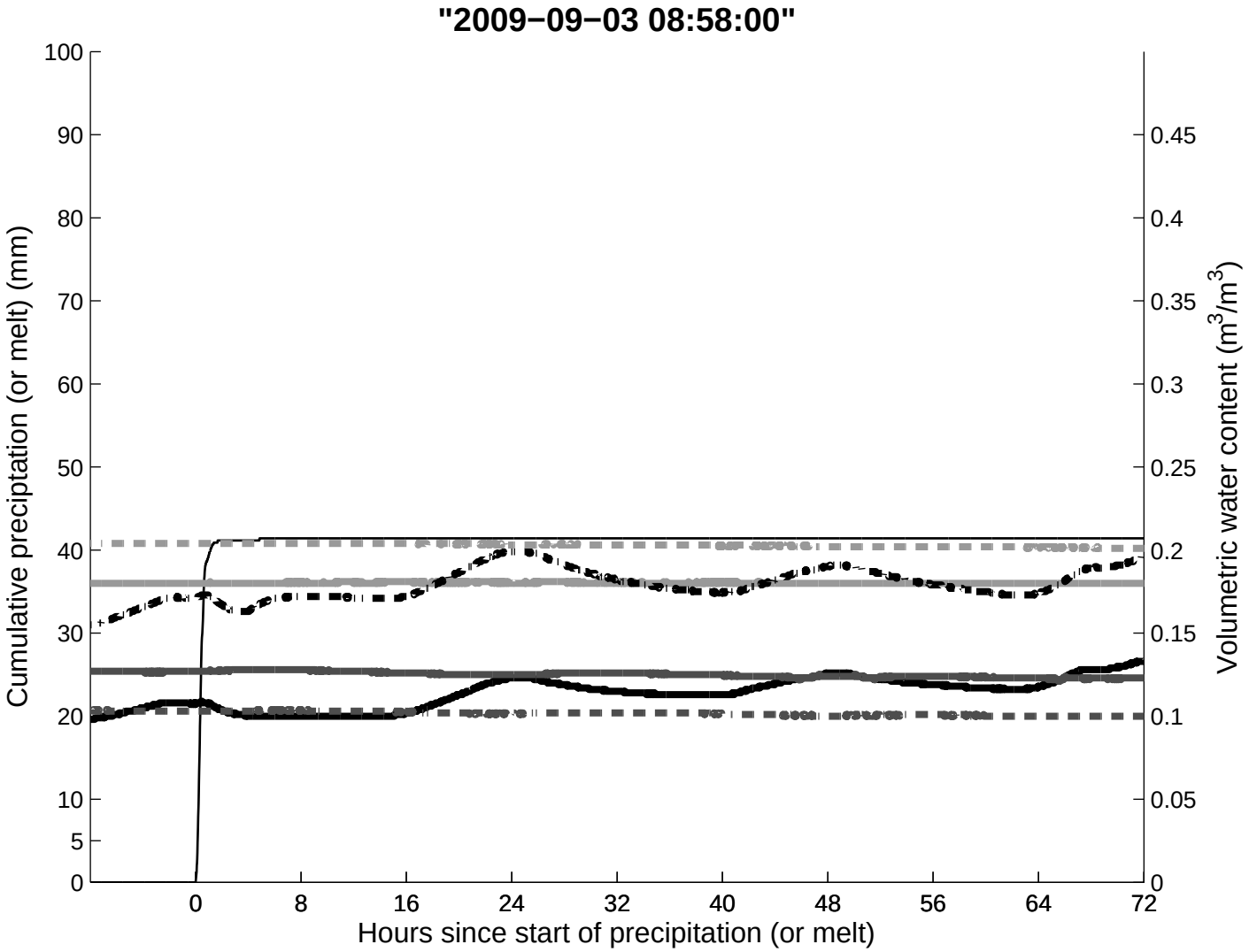
"2009−09−03 08:58:00"
Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
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90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
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0
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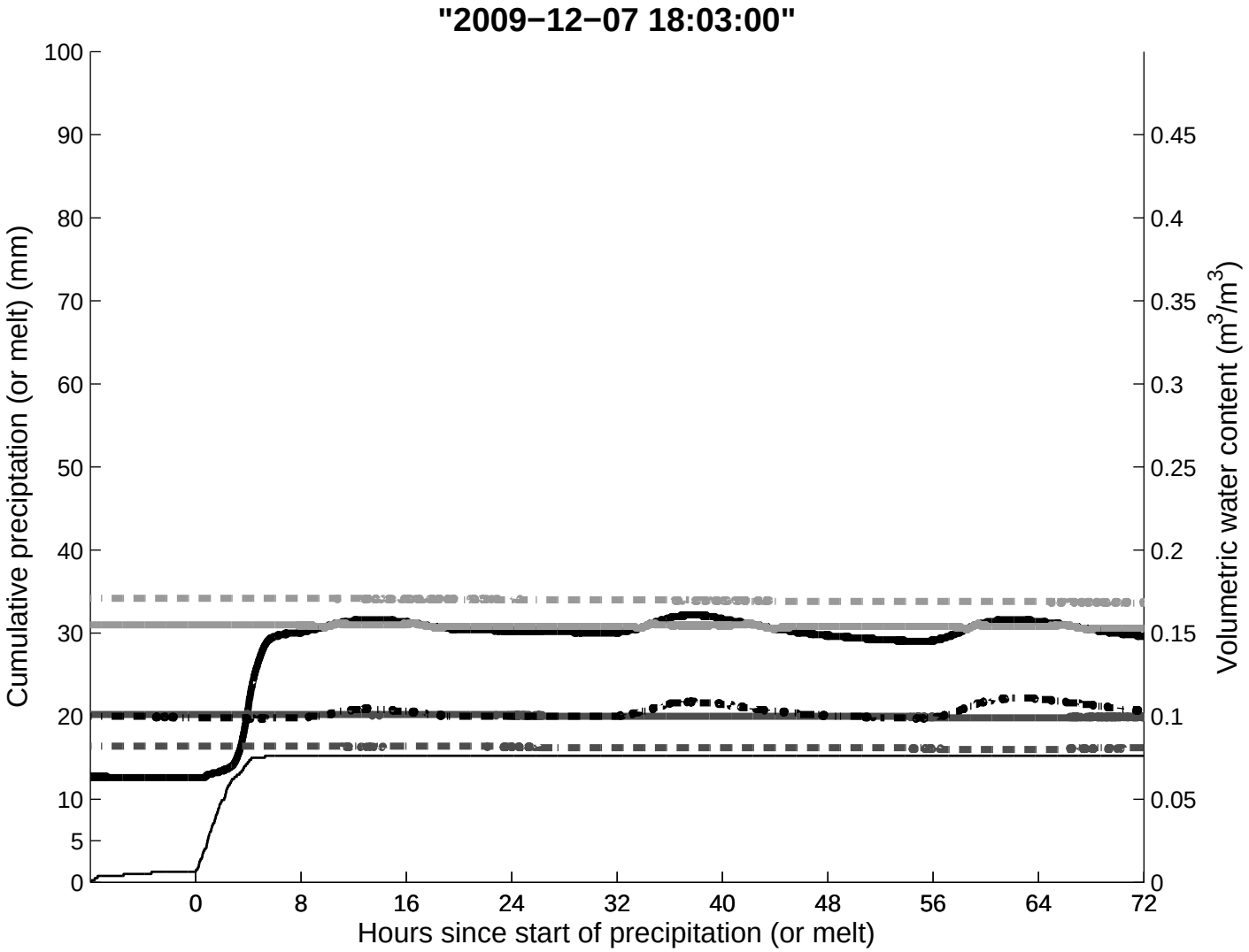
32
40
48
56
64
72


"2009−12−07 18:03:00"
Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
100
90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
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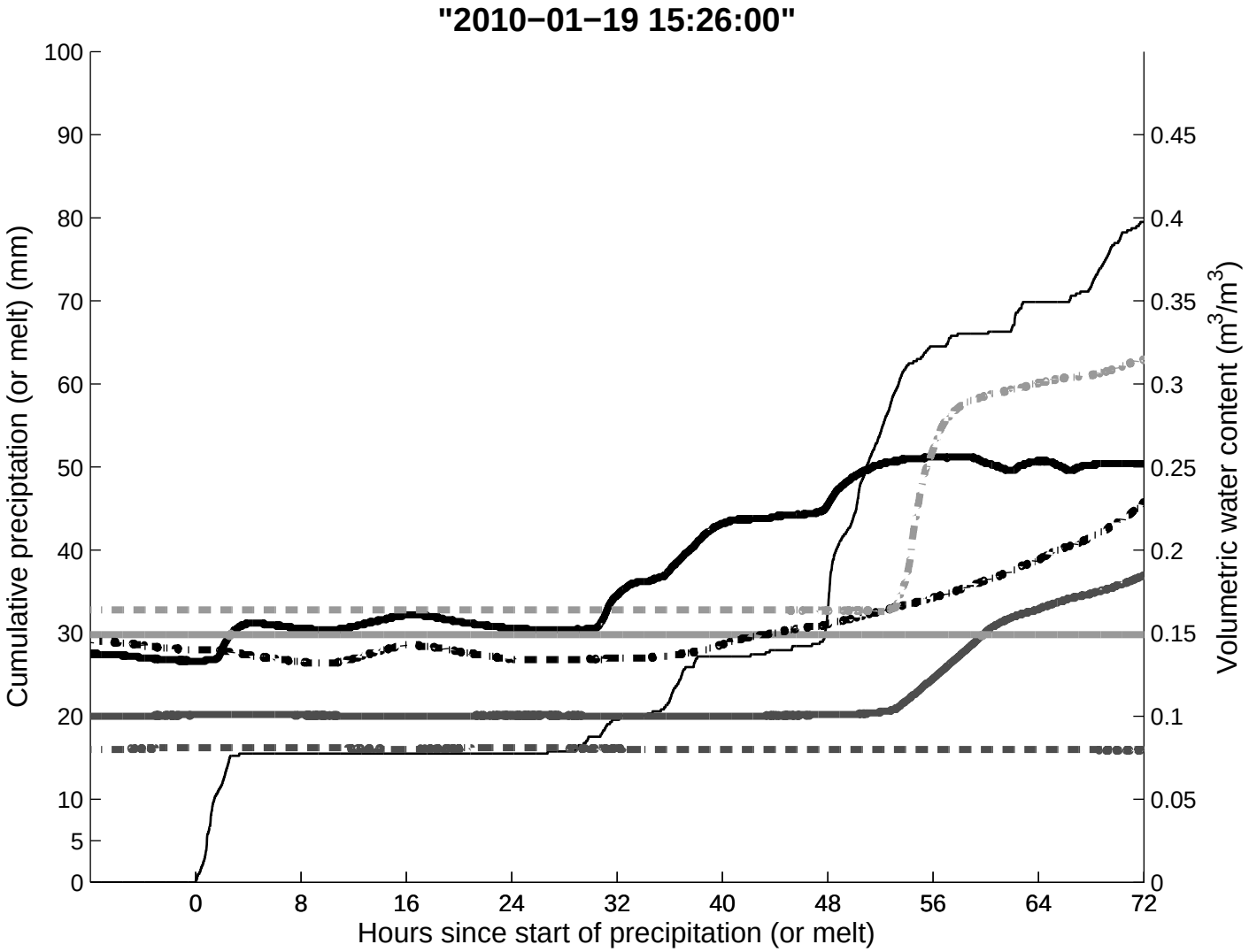
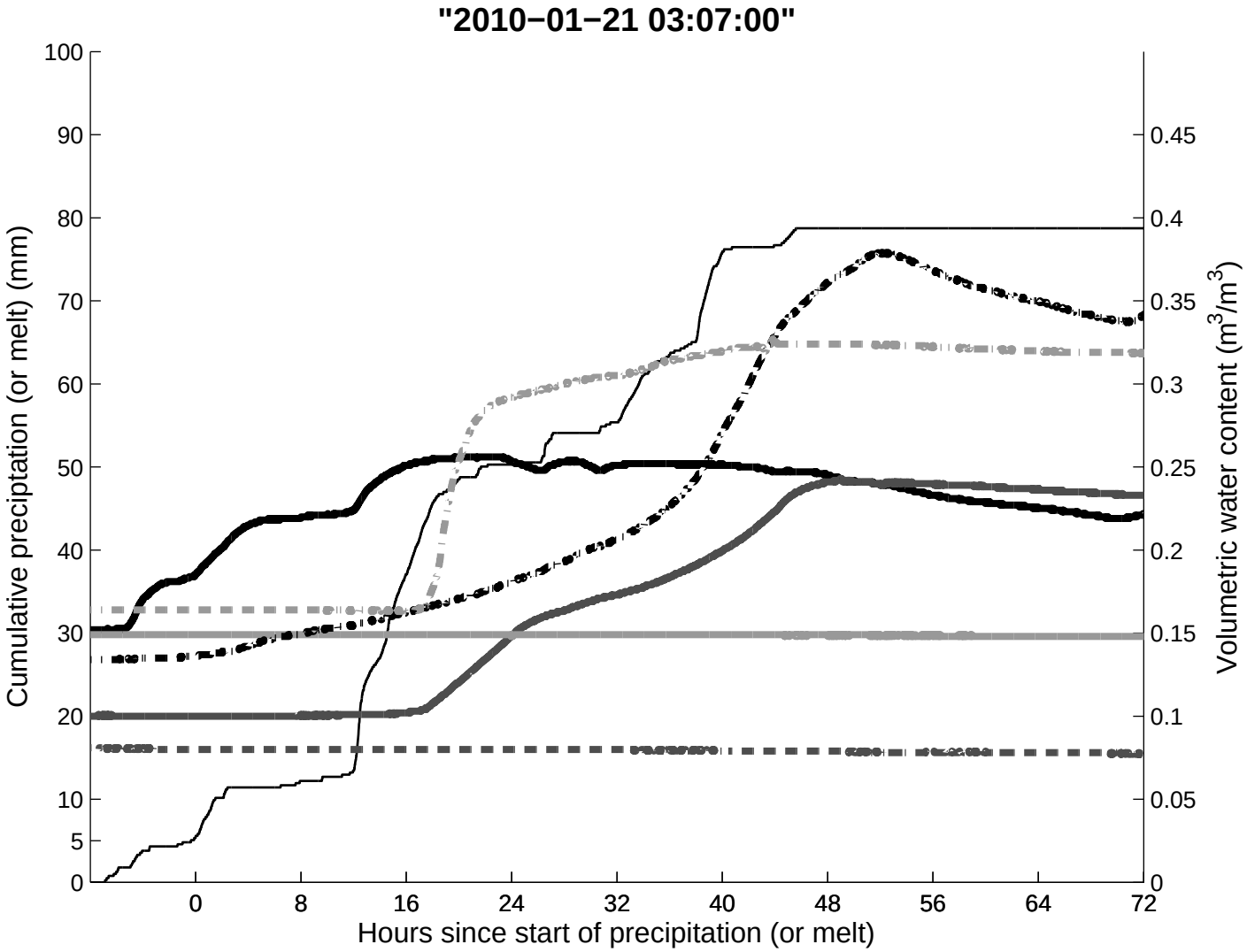
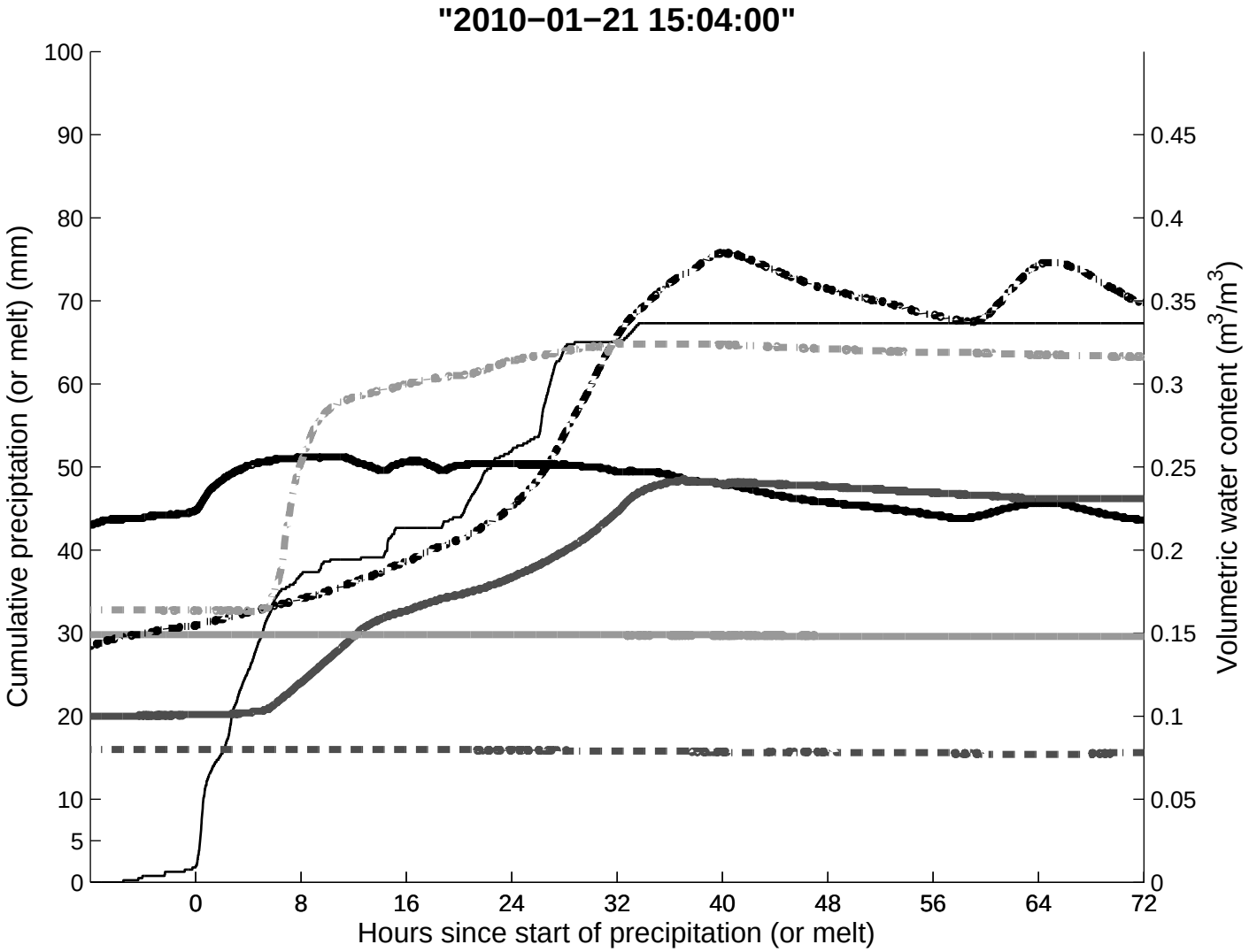
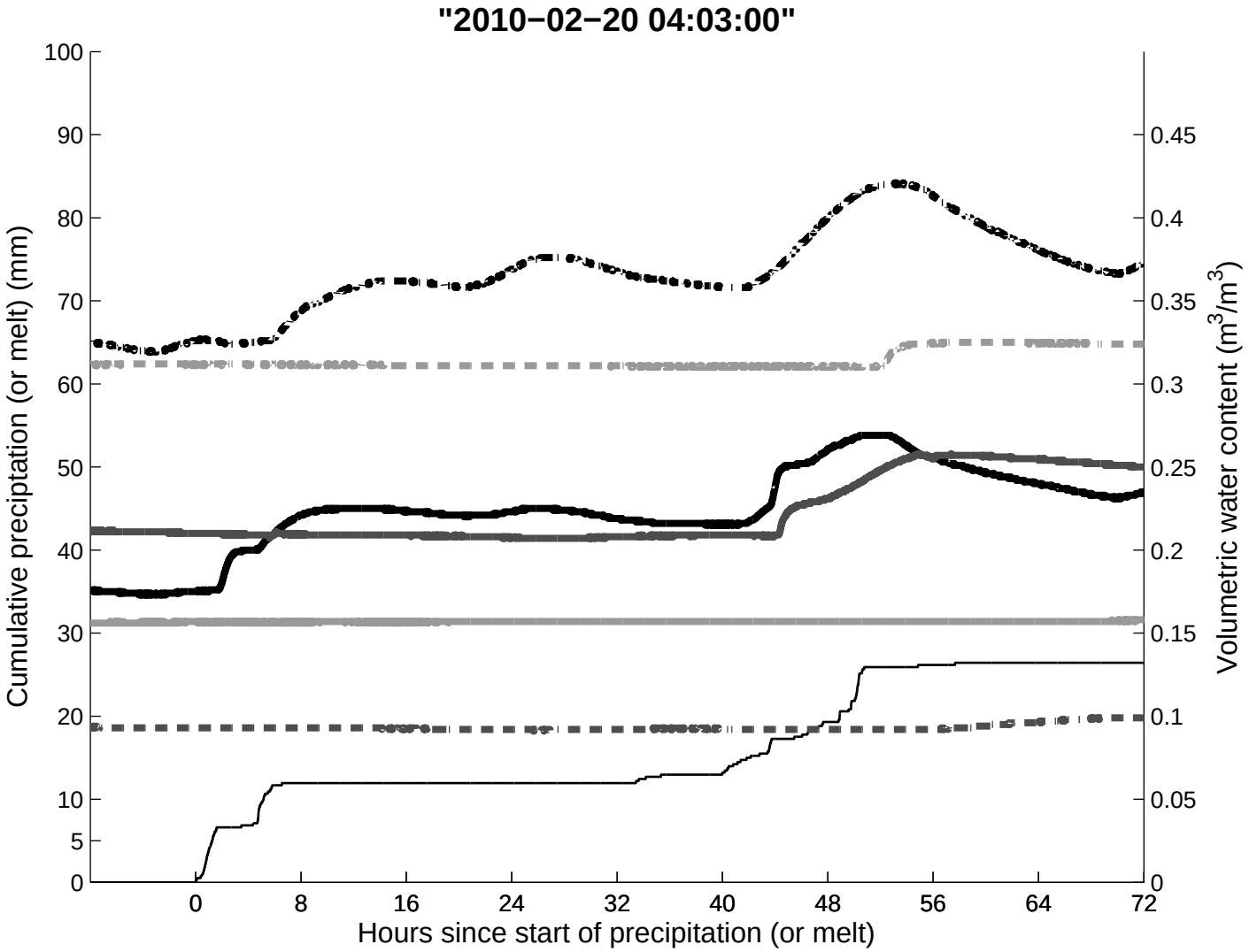
48
56
64
72


"2010−01−19 15:26:00"
Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
100
90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
8
16
24
32
40
48
56
64
72


"2010−01−21 03:07:00"
Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
100
90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
8
16
24
32
40
48
56
64
72


"2010−01−21 15:04:00"
Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
100
90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
8
16
24
32
40
48
56
64
72


"2010−02−20 04:03:00"
Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
100
90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
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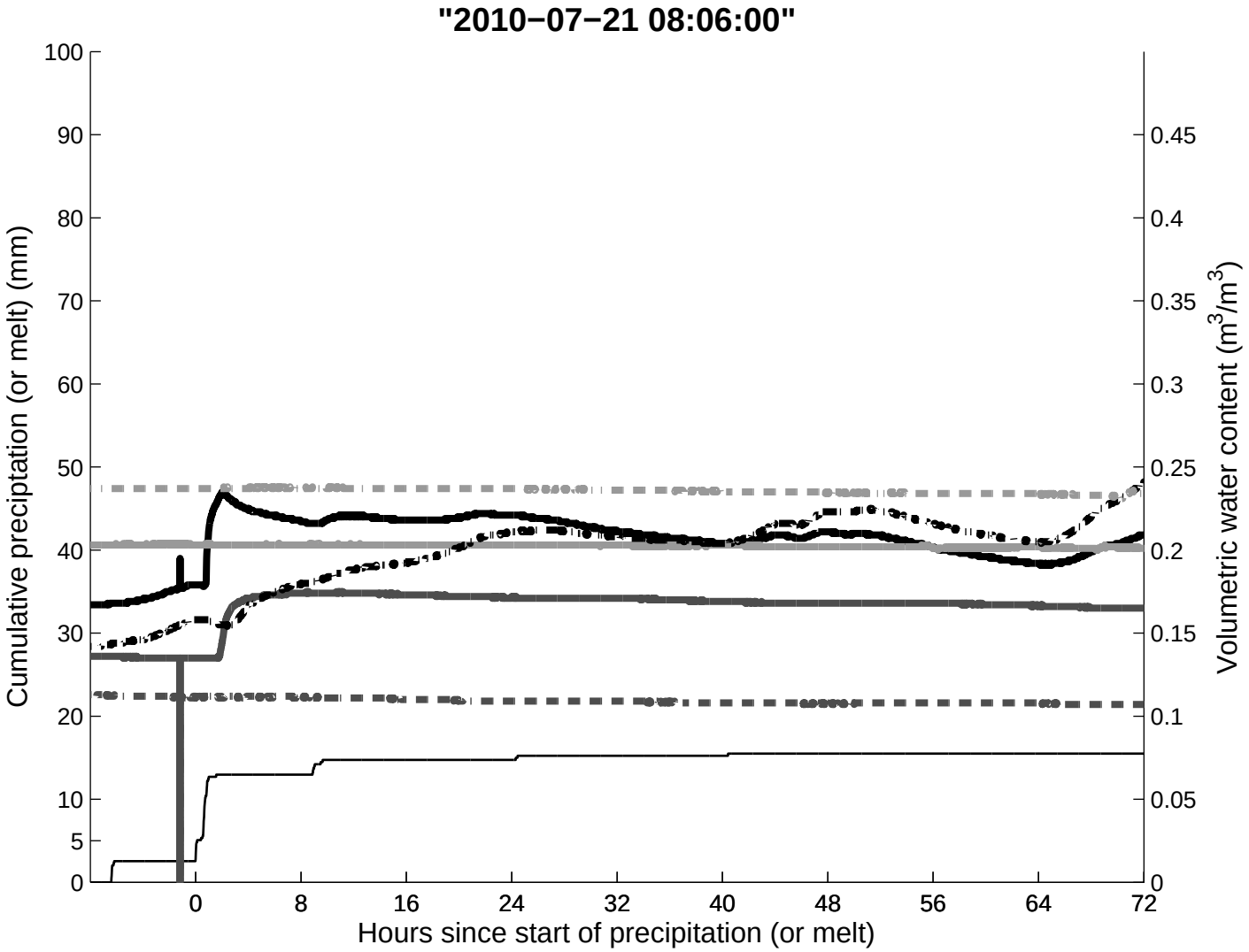
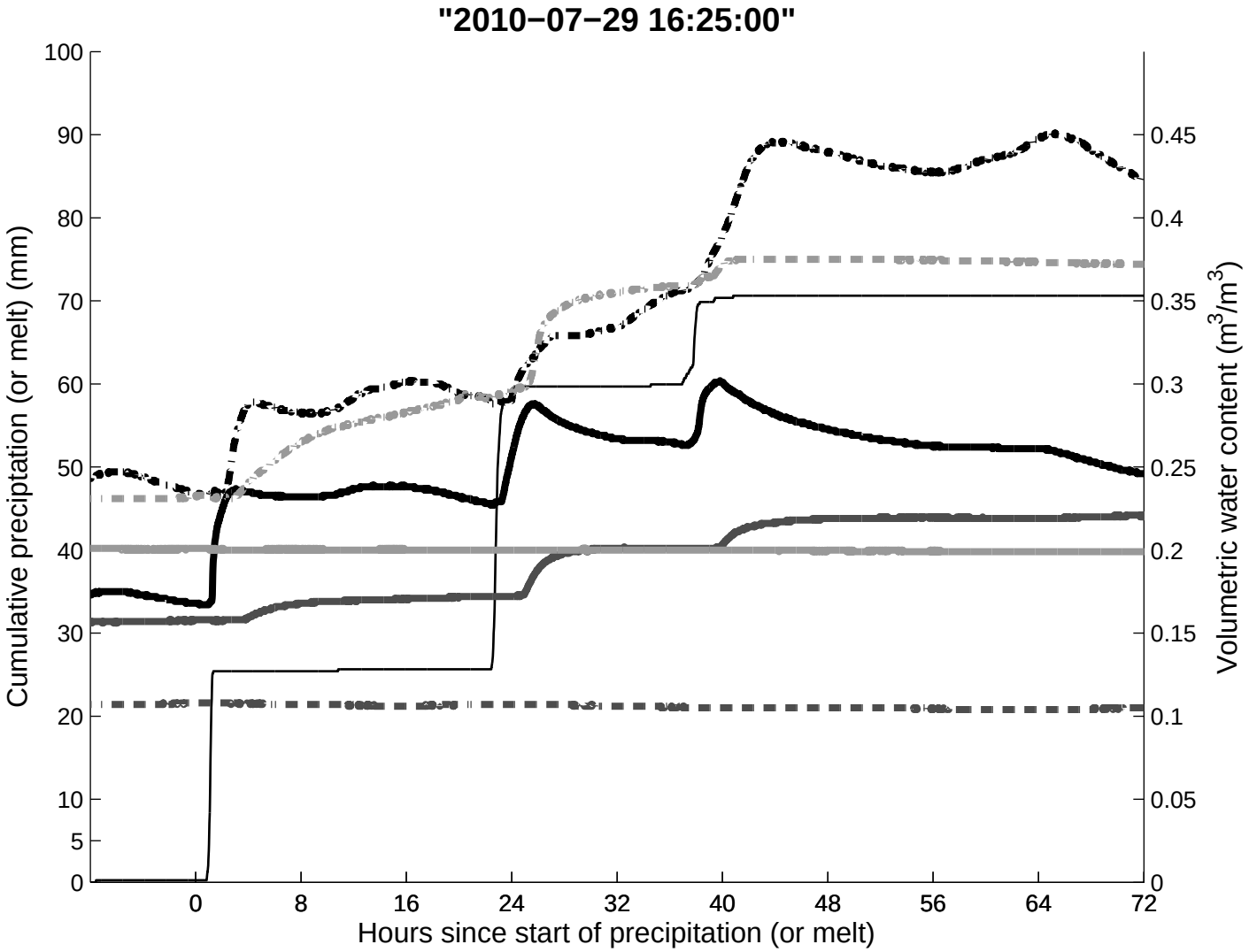
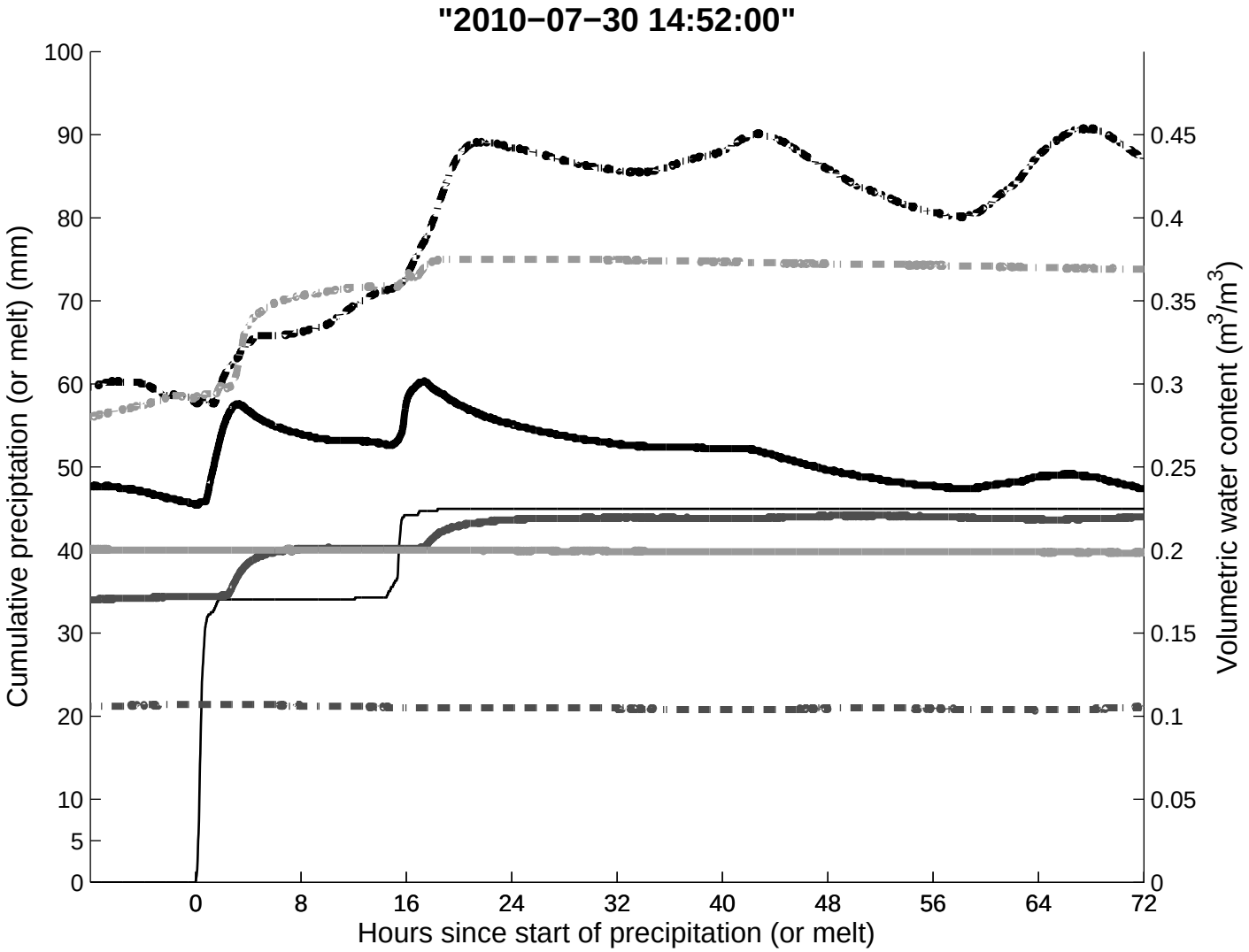
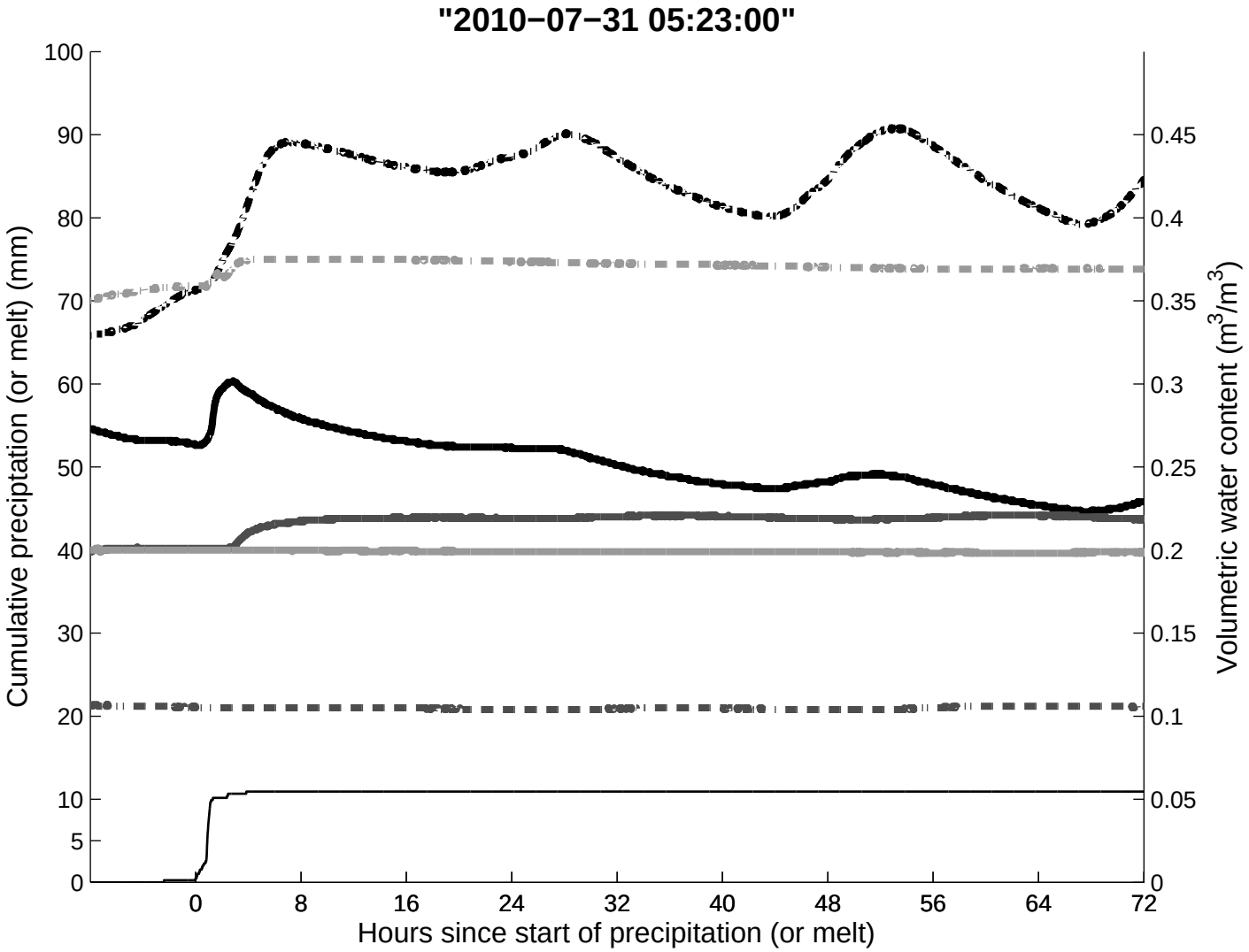
8
16
24
32
40
48
56
64
72


"2010−07−21 08:06:00"
Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
100
90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
8
16
24
32
40
48
56
64
72


"2010−07−29 16:25:00"
Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
100
90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
8
16
24
32
40
48
56
64
72


"2010−07−30 14:52:00"
Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
100
90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0
8
16
24
32
40
48
56
64
72


"2010−07−31 05:23:00"
Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
100
90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
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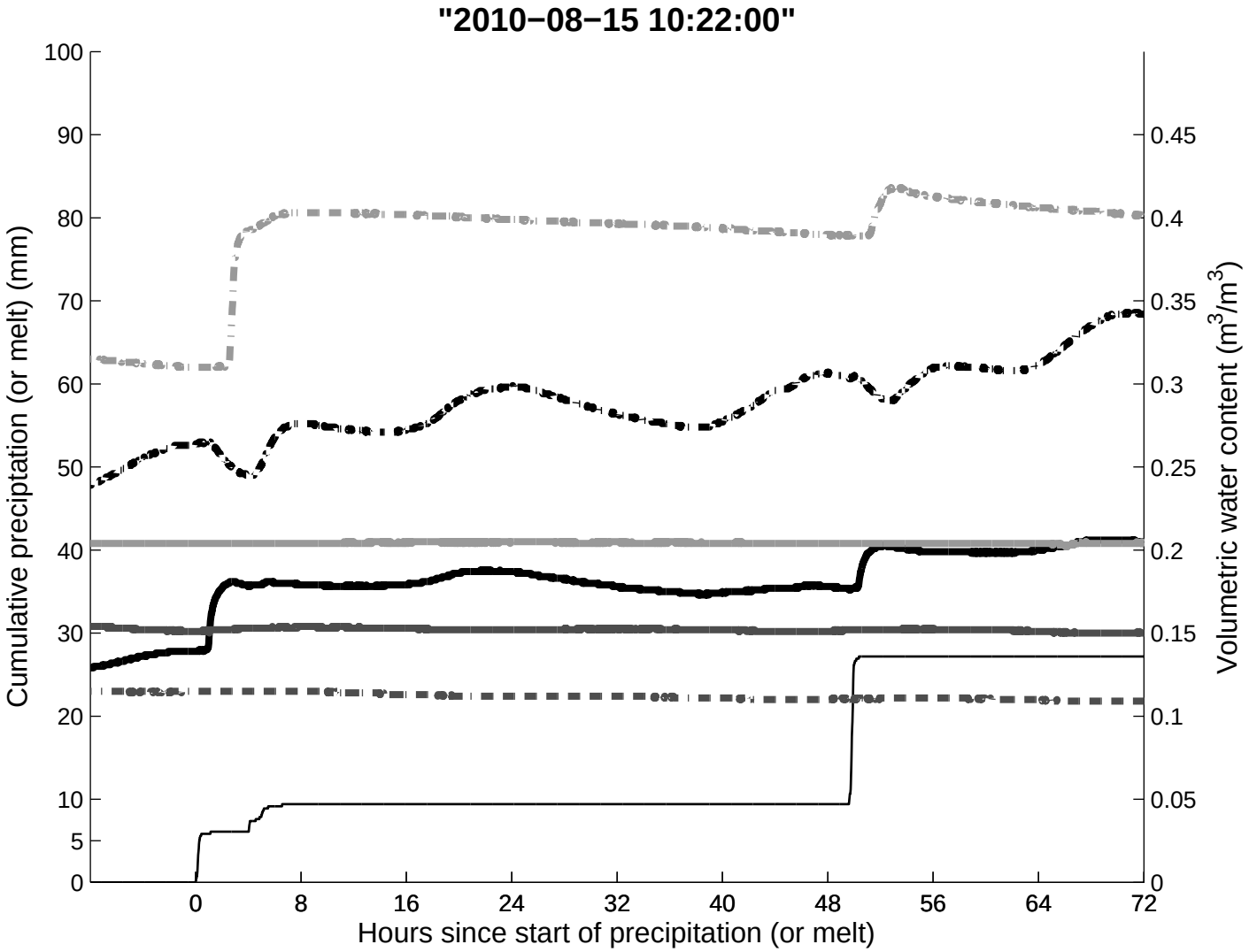
16
24
32
40
48
56
64
72


"2010−08−15 10:22:00"
Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
100
90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
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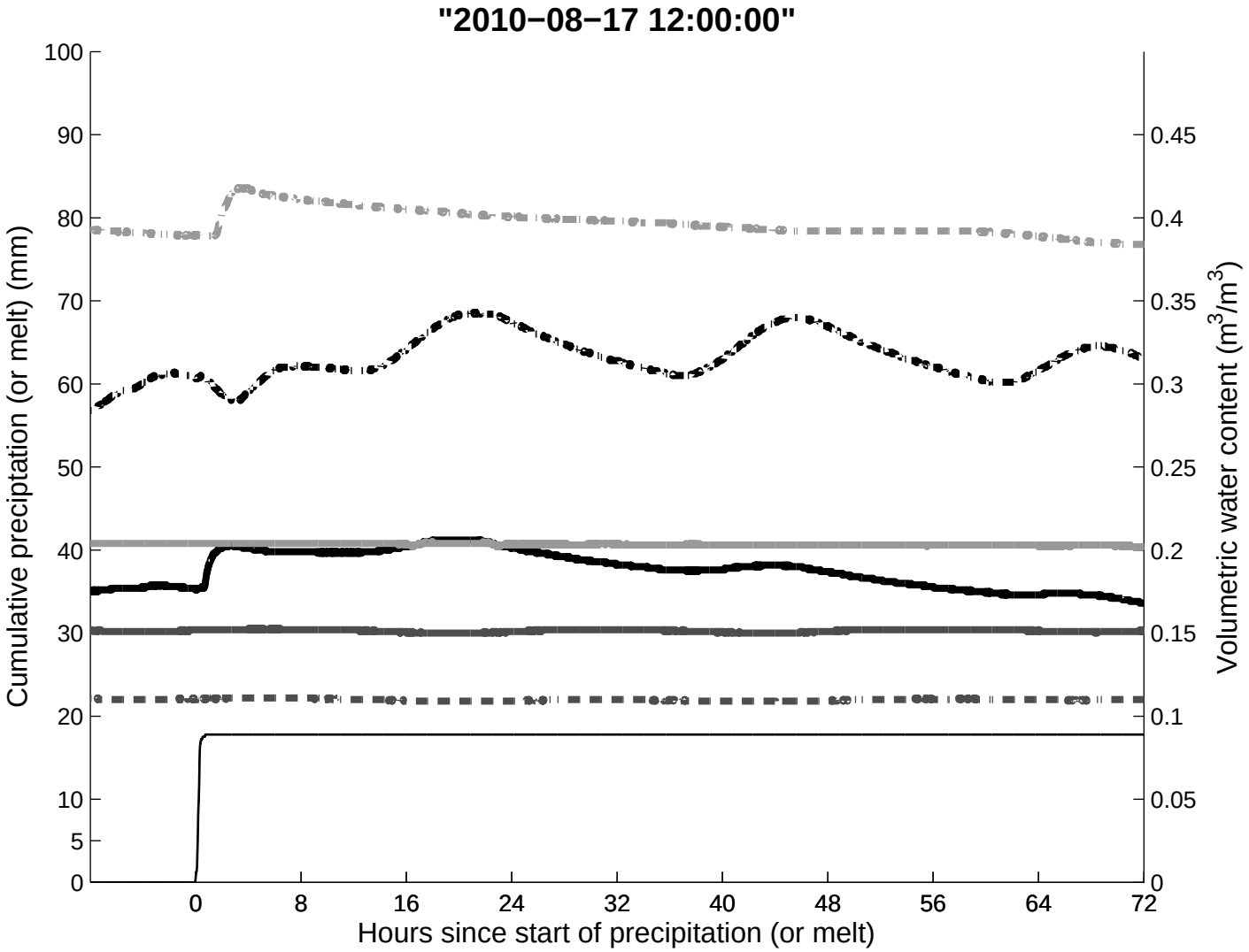
8
16
24
32
40
48
56
64
72


"2010−08−17 12:00:00"
Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
100
90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
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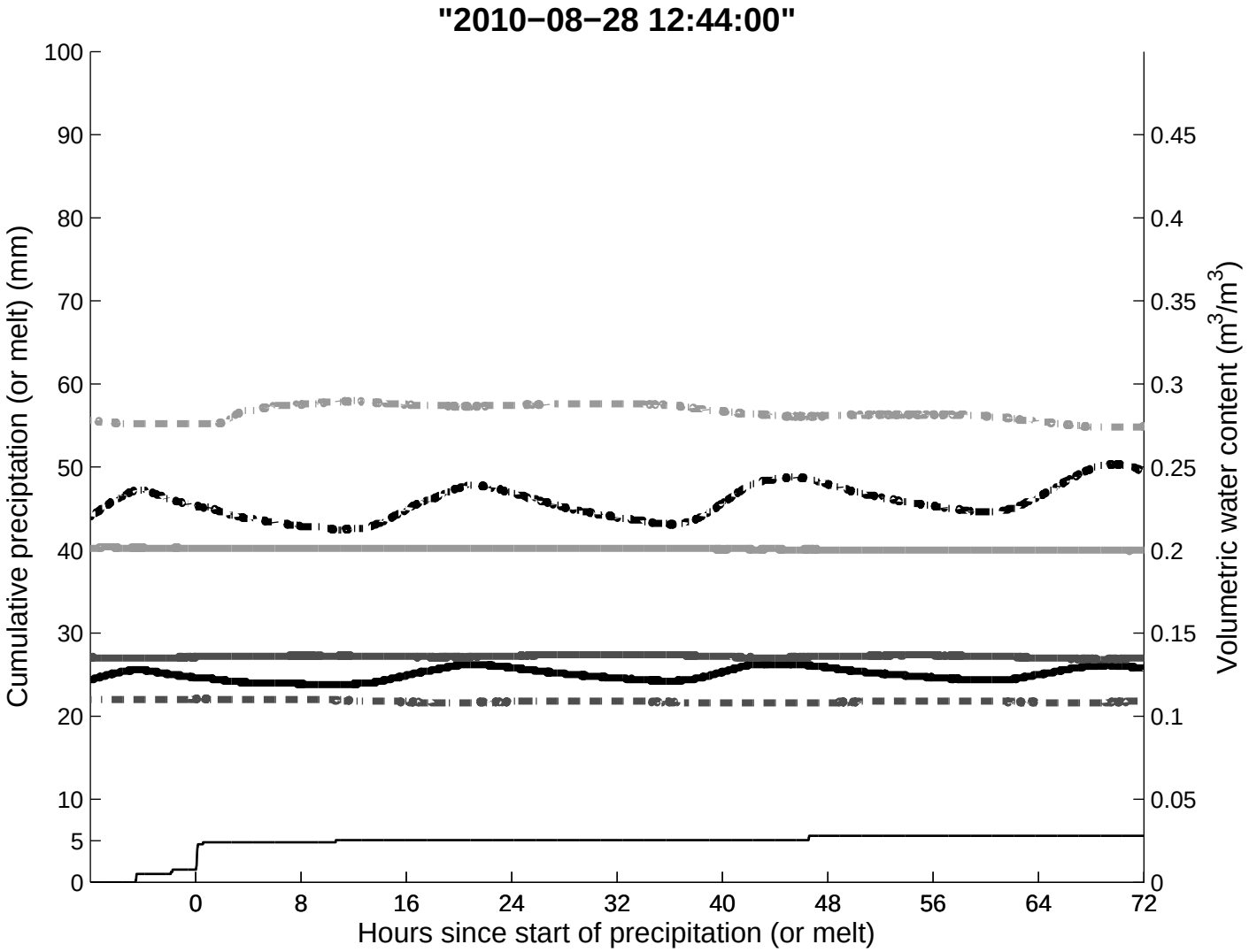
8
16
24
32
40
48
56
64
72


"2010−08−28 12:44:00"
Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
100
90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
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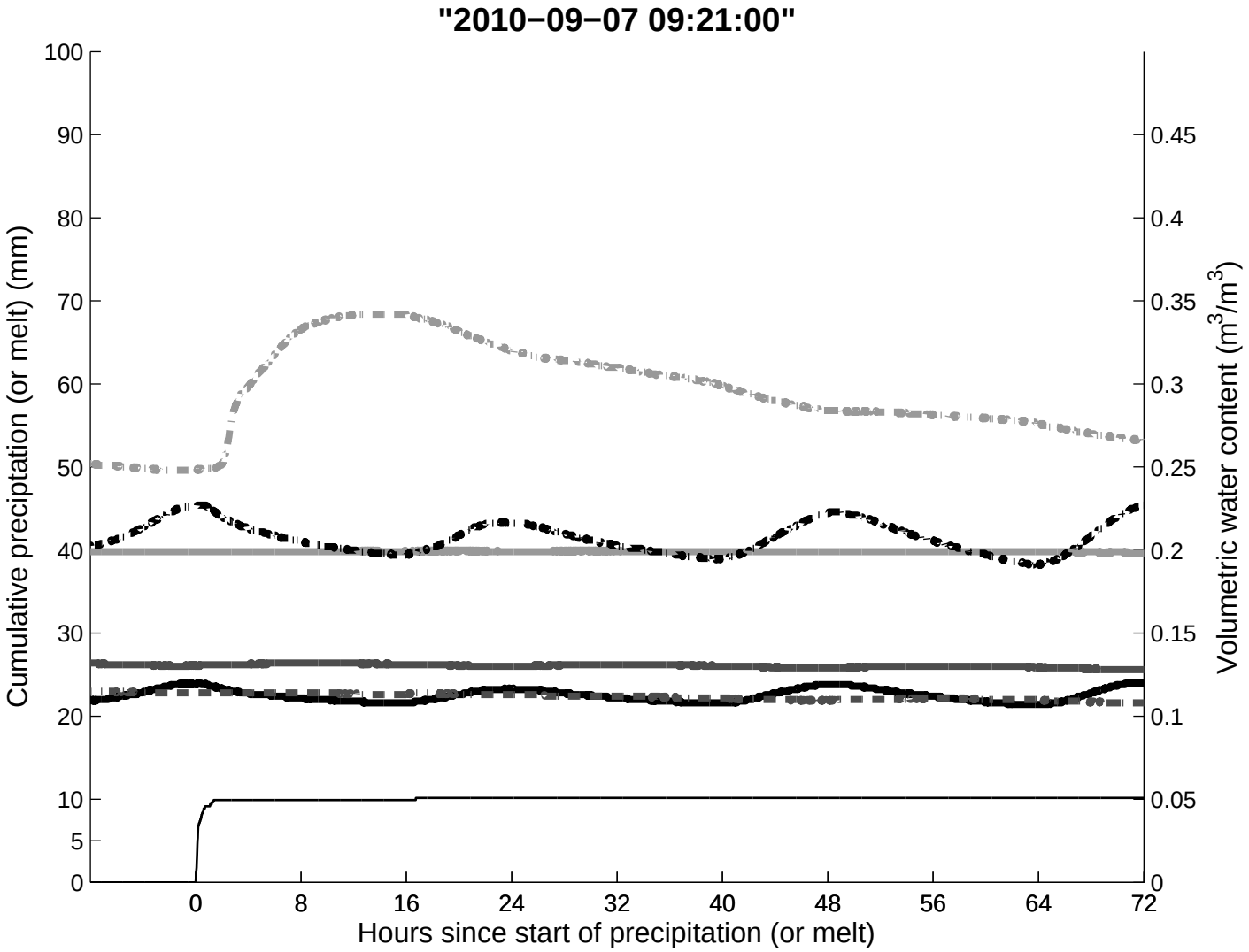
56
64
72


"2010−09−07 09:21:00"
Cumulative preciptation (or melt) (mm)
Volumetric water content (m3/m3)
Hours since start of precipitation (or melt)
100
90
80
70
60
50
40
30
20
10
5
0
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
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48
56
64
72

Figure S1. Erosion caused by shallow overland flow on November 27, 2008. Post-event debris apron is suggestive of mass-wasting deposit, but was detached by fluvial action on steep channel headwall. The headwall did not change for at least 3 months afterwards, as seen by comparison with photo taken January 28, 2009, indicating mass wasting in absence of overland flow is rare. White cylinders are developmental-stage wireless sensors not discussed in this paper.

Matlab data and accompanying data files

Video showing site overview as well as active runoff erosion at Page Ranch,

Arizona