

ECHO - LOG

Heiligerlee K

Shaft survey

21.12.2017

174 097





**Results of the Cavity Survey
by means of Echo-Sounding
in the cavity**

Heiligerlee K

Date: 21.12.2017

Report No.: 174 097

Customer: N.V. Nederlandse Gasunie, Heiligerlee

Responsible for the survey:

Surveyor :
Leadership :
Interpreter :
Control :



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Summary of results

Legend

Enclosures:

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Diameter and radii (diagrams and lists)

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Horizontal sections

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Summary of results

Well details

All depths are given as:	MD
Datum level for all depths:	surface
Shoe of the cemented 10 ¾"-casing:	981.0 m
Reference depth for ECHO-LOG:	981.0 m

Details of survey equipment

Measuring vehicle used:	L 118
Tools used:	Echo tool BSF 2 64

General details

Number of runs:	1
Measured horizontal sections:	62
Lowest survey depth:	1012.0 m



Maximum and minimum dimensions with ref. to the measuring axis

Reference direction: **magnetic north**

Determination out of 36 vertical sections derived from horizontally measured data at 5 degree intervals:

minimum radius:	0.03 m
depth:	1000.5 m
direction:	335°

maximum radius:	0.42 m
depth:	995.0 m
direction:	220°

highest point of cavity:	981.5 m
horizontal distance:	0.13 m
direction:	0°

lowest point of cavity:	1012.0 m
horizontal distance:	0.17 m
direction:	0°

lowest point in the measuring axis:	1012.0 m
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Determination out of 62 horizontal sections in the depths between 981.5 m and 1012.0 m at 5° degree intervals:

maximum radius:	0.42 m
depth:	995.0 m
direction:	220°

maximum diameter:	0.53 m
depth:	997.5 m
direction:	40 - 220°

Volume

volume:	3.98 m ³
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depth range:	981.0 m <--> 1012.5 m
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Spiral survey

The shape of the cavity in the region from 1012.0 m to 981.5 m was recorded spirally by continuous moving and simultaneous rotating of the echo tool.

To enable a correct volume calculation, the necessary horizontal sections were determined by interpolating the spirally measured data. The resulting horizontal sections are presented in this report too.

Interpretation

Supposing a rectilinear propagation of ultrasonic waves all recorded echo travel times were converted into distances by using the subsequent speeds of sound:

406.7 m/s to 407.0 m/s in nitrogen (measured)

In the case of recording several echoes along one trace of echo signals, the representative echo signal was selected according to the level of amplitude, transmission time, density of measured points and the shape of the cavity.

Horizontal sections

62 horizontal sections at following measured depths are included as graphical plots in this report:

981.5 m	982.0 m	982.5 m	983.0 m	983.5 m	984.0 m	984.5 m
985.0 m	985.5 m	986.0 m	986.5 m	987.0 m	987.5 m	988.0 m
988.5 m	989.0 m	989.5 m	990.0 m	990.5 m	991.0 m	991.5 m
992.0 m	992.5 m	993.0 m	993.5 m	994.0 m	994.5 m	995.0 m
995.5 m	996.0 m	996.5 m	997.0 m	997.5 m	998.0 m	998.5 m
999.0 m	999.5 m	1000.0 m	1000.5 m	1001.0 m	1001.5 m	1002.0 m
1002.5 m	1003.0 m	1003.5 m	1004.0 m	1004.5 m	1005.0 m	1005.5 m
1006.0 m	1006.5 m	1007.0 m	1007.5 m	1008.0 m	1008.5 m	1009.0 m
1009.5 m	1010.0 m	1010.5 m	1011.0 m	1011.5 m	1012.0 m	

Vertical sections

The shape of the cavity was determined by interpretation of all horizontally and tilted measured data and is presented by 36 vertical sections in this report.



Maximum plots (top view)

The maximum plot presents the largest extension of the cavity in a top view. The first picture shows the areas of all horizontal sections and the area resulting out of the vertical sections (hatched). The resulting total area is shown in the second picture (cross hatching) together with the largest single area.

In both pictures the total centre of gravity of the cavity is shown with its distance and its direction referring to the measuring axis.

The total centre of gravity is derived out of the envelope, which is the connection line of the largest cavity extension in every direction

Perspective views

Several perspective drawings are included in this report to give a quick review of detailed relations.



LEGEND

-  Measured point recorded with horizontal adjusted ultrasonic transducer
-  Measured point recorded with tilted or vertical orientated ultrasonic transducer
-  Interpolated point derived from the vertical sections
-  Connection line between two measured points in order to calculate the volume
-  Assumed connection line (in areas which are not sufficiently covered by measured points)
- GiN** Grid-North
- N** Magnetic north determined with compass inside the tool
(magnetic compass in areas without tubing)
(fibre gyro compass in areas with tunings)
- (N)** Assumed north direction (for sections in magnetic disturbed surroundings without fibre gyro compass)
- a** Longest extension in section
(without considering of hidden leached pockets)
- b** Longest extension in section perpendicular to a
(without considering of hidden leached pockets)
- a/b** Ratio of longest extensions in section which are perpendicular to each other
- (+ xx m²)** Area in actual section resulting from hidden leached pockets
- r~** Average radius



Volume list

Cavity: Heiligerlee K

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Depth [m]	Radius [m]	Area [m ²]	Depth range [m]		Volume [m ³]	
			from	to	partial	total
981.5	0.12	0.05	981.00	981.75	0.03	0.03
982.0	0.13	0.05	981.75	982.25	0.03	0.06
982.5	0.13	0.05	982.25	982.75	0.03	0.08
983.0	0.13	0.06	982.75	983.25	0.03	0.11
983.5	0.20	0.13	983.25	983.75	0.07	0.18
984.0	0.20	0.13	983.75	984.25	0.06	0.24
984.5	0.20	0.12	984.25	984.75	0.06	0.30
985.0	0.20	0.12	984.75	985.25	0.06	0.36
985.5	0.19	0.11	985.25	985.75	0.05	0.42
986.0	0.19	0.11	985.75	986.25	0.06	0.47
986.5	0.19	0.12	986.25	986.75	0.06	0.53
987.0	0.19	0.11	986.75	987.25	0.06	0.59
987.5	0.19	0.11	987.25	987.75	0.06	0.64
988.0	0.19	0.11	987.75	988.25	0.06	0.70
988.5	0.19	0.11	988.25	988.75	0.06	0.76
989.0	0.19	0.11	988.75	989.25	0.06	0.81
989.5	0.19	0.12	989.25	989.75	0.06	0.87
990.0	0.19	0.12	989.75	990.25	0.06	0.93
990.5	0.19	0.12	990.25	990.75	0.06	0.99
991.0	0.19	0.12	990.75	991.25	0.06	1.05
991.5	0.19	0.12	991.25	991.75	0.06	1.10
992.0	0.20	0.12	991.75	992.25	0.06	1.16
992.5	0.19	0.12	992.25	992.75	0.06	1.22
993.0	0.19	0.12	992.75	993.25	0.06	1.28
993.5	0.19	0.12	993.25	993.75	0.06	1.34
994.0	0.20	0.12	993.75	994.25	0.06	1.40
994.5	0.24	0.18	994.25	994.75	0.09	1.49
995.0	0.23	0.17	994.75	995.25	0.09	1.57
995.5	0.22	0.16	995.25	995.75	0.08	1.65
996.0	0.22	0.15	995.75	996.25	0.08	1.73
996.5	0.21	0.14	996.25	996.75	0.07	1.80
997.0	0.21	0.14	996.75	997.25	0.07	1.87
997.5	0.24	0.19	997.25	997.75	0.09	1.96
998.0	0.22	0.15	997.75	998.25	0.07	2.04
998.5	0.20	0.13	998.25	998.75	0.07	2.10
999.0	0.20	0.12	998.75	999.25	0.06	2.16
999.5	0.19	0.11	999.25	999.75	0.06	2.22
1000.0	0.19	0.11	999.75	1000.25	0.06	2.27
1000.5	0.19	0.11	1000.25	1000.75	0.06	2.33
1001.0	0.19	0.11	1000.75	1001.25	0.06	2.39
1001.5	0.19	0.12	1001.25	1001.75	0.06	2.44
1002.0	0.20	0.12	1001.75	1002.25	0.06	2.50
1002.5	0.19	0.11	1002.25	1002.75	0.06	2.56
1003.0	0.19	0.12	1002.75	1003.25	0.06	2.62
1003.5	0.20	0.12	1003.25	1003.75	0.06	2.68
1004.0	0.20	0.12	1003.75	1004.25	0.06	2.74
1004.5	0.20	0.13	1004.25	1004.75	0.06	2.80
1005.0	0.20	0.13	1004.75	1005.25	0.06	2.87



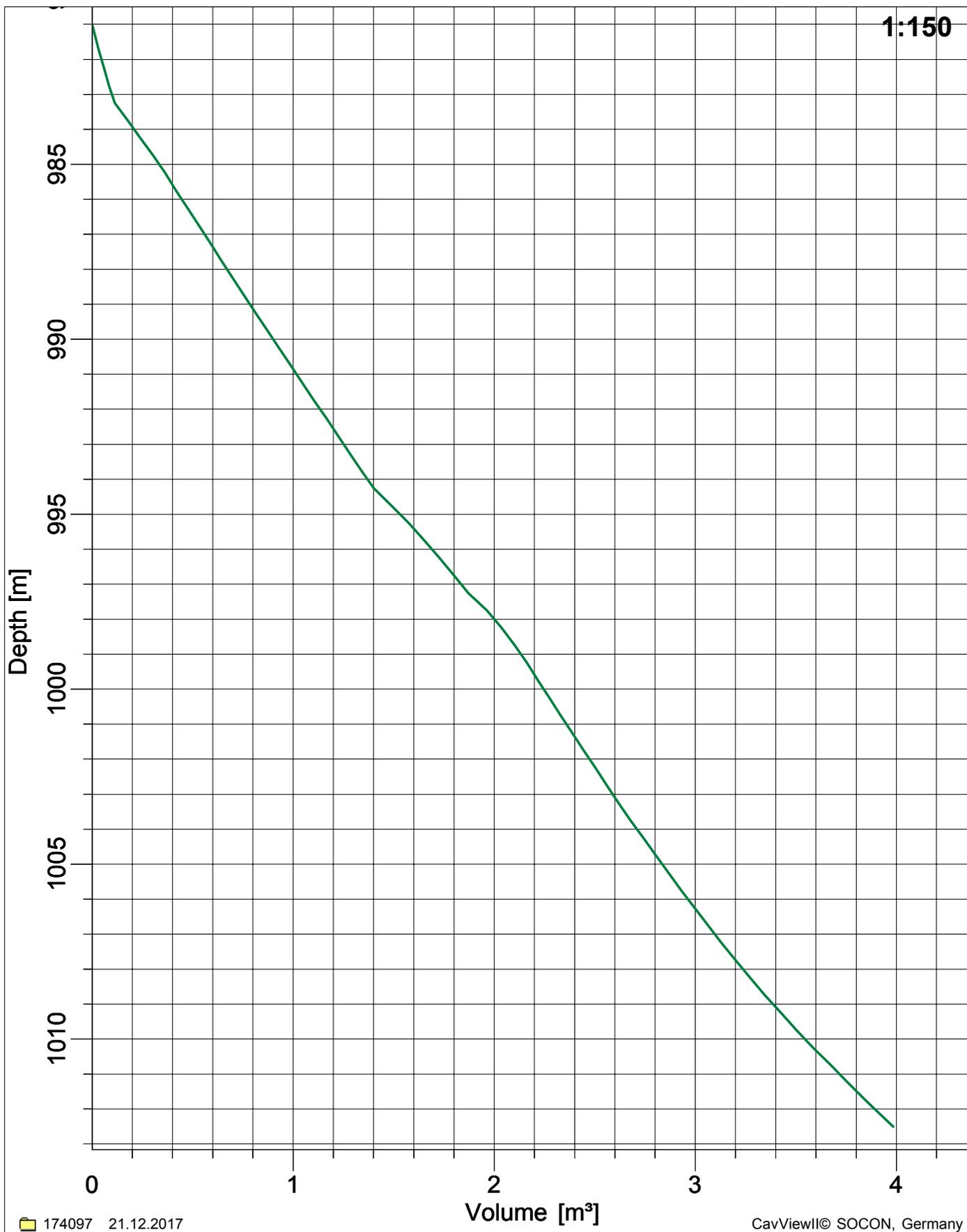
Volume list

Cavity: Heiligerlee K

174097

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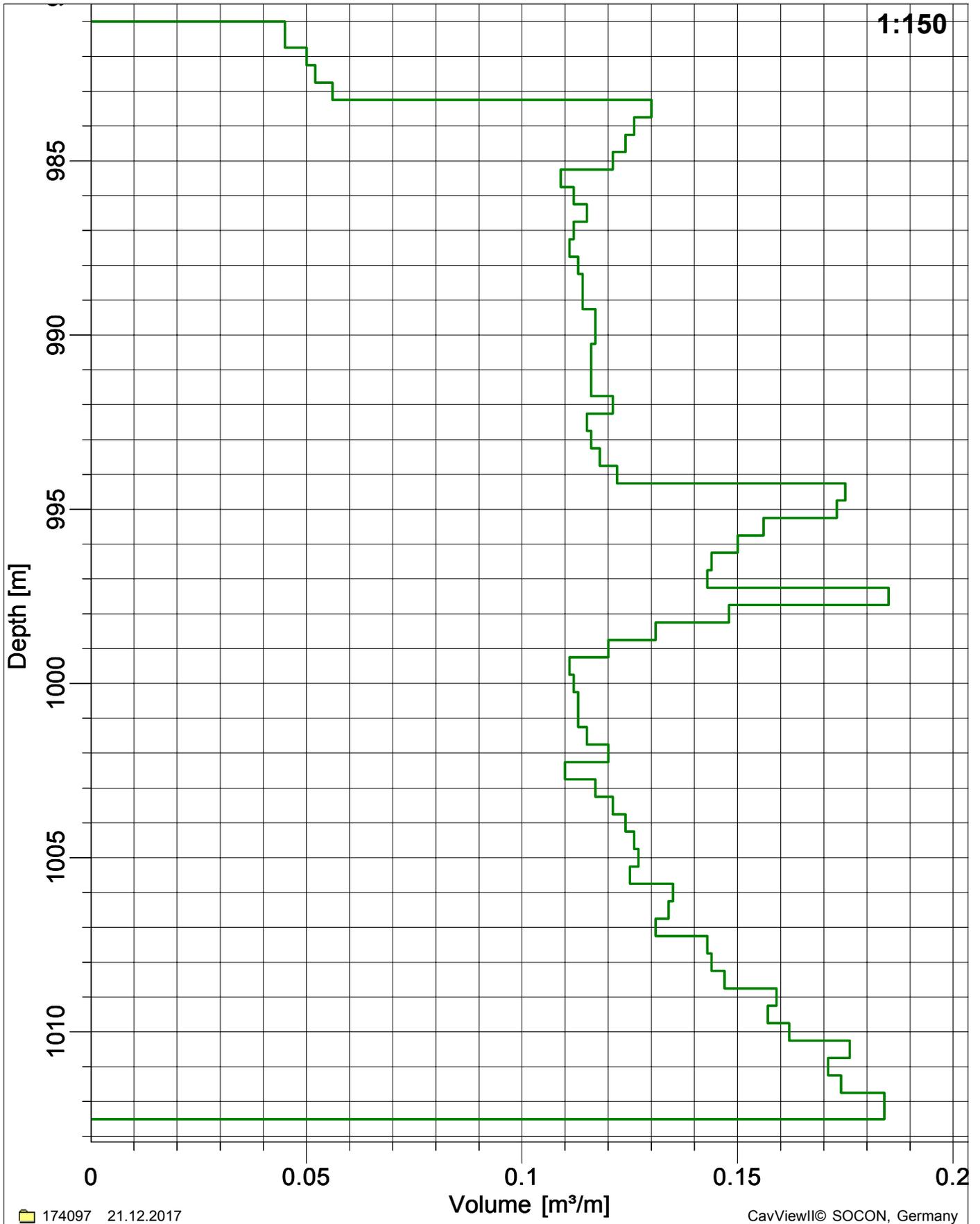
Depth [m]	Radius [m]	Area [m ²]	Depth range [m]		Volume [m ³]	
			from	to	partial	total
1005.5	0.20	0.13	1005.25	1005.75	0.06	2.93
1006.0	0.21	0.14	1005.75	1006.25	0.07	3.00
1006.5	0.21	0.13	1006.25	1006.75	0.07	3.06
1007.0	0.20	0.13	1006.75	1007.25	0.07	3.13
1007.5	0.21	0.14	1007.25	1007.75	0.07	3.20
1008.0	0.21	0.14	1007.75	1008.25	0.07	3.27
1008.5	0.22	0.15	1008.25	1008.75	0.07	3.35
1009.0	0.22	0.16	1008.75	1009.25	0.08	3.43
1009.5	0.22	0.16	1009.25	1009.75	0.08	3.50
1010.0	0.23	0.16	1009.75	1010.25	0.08	3.59
1010.5	0.24	0.18	1010.25	1010.75	0.09	3.67
1011.0	0.23	0.17	1010.75	1011.25	0.09	3.76
1011.5	0.24	0.17	1011.25	1011.75	0.09	3.85
1012.0	0.24	0.18	1011.75	1012.50	0.14	3.98



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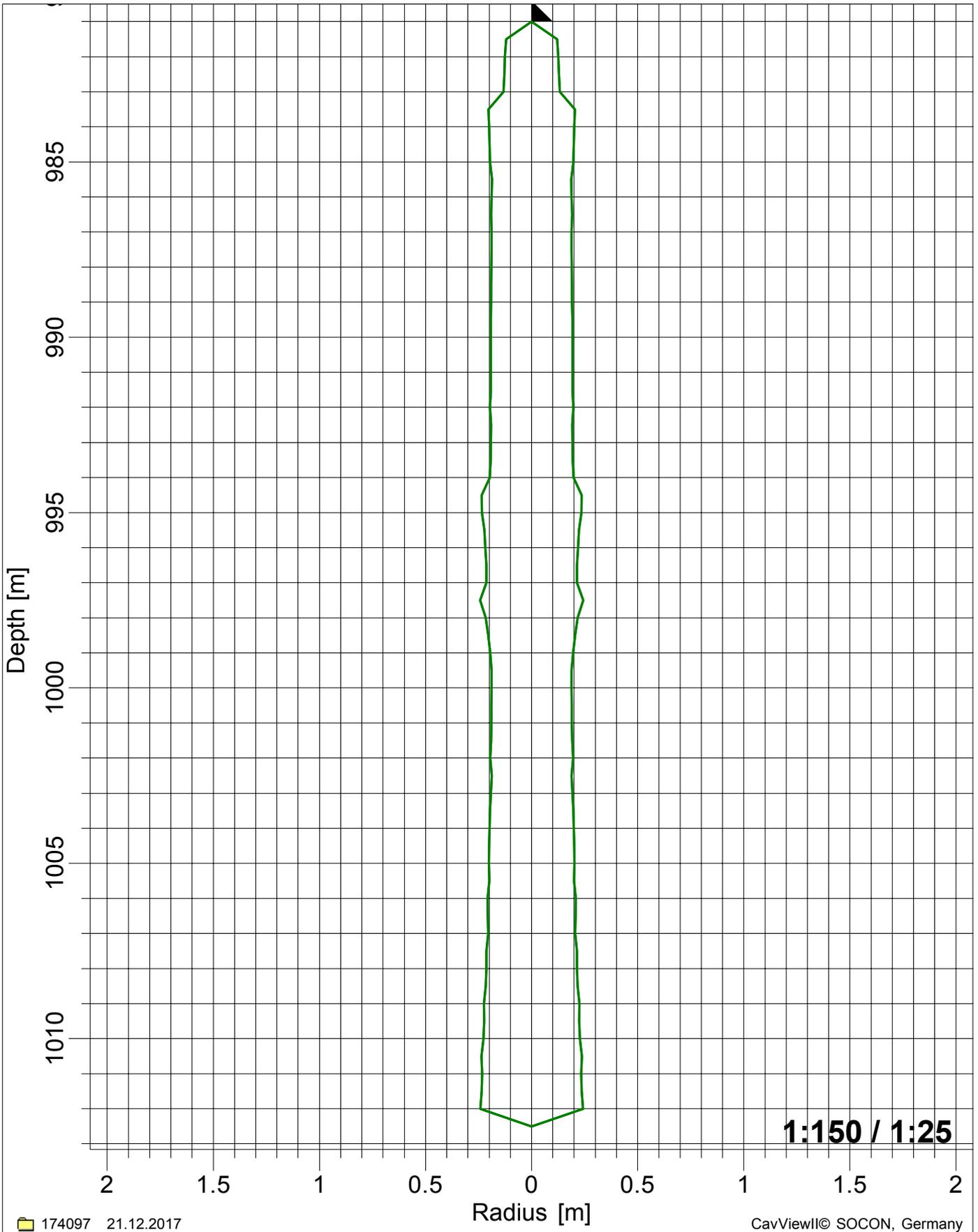
— Total volume = 4.0 m³



Heiligerlee K

AVERAGE RADIUS

21.12.2017



▲ 10 3/4" : 981.0 m

— Average radius (21.12.2017)



Table of radii and diameters

Cavity: Heiligerlee K

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21.12.2017

Depth [m]	Radius [MIN]		Radius [MAX]		Diameter [MIN]		Diameter [MAX]	
	[m]	[°]	[m]	[°]	[m]	[°]	[m]	[°]
981.5	0.10	215	0.15	25	0.23	75 <-> 255	0.25	25 <-> 205
982.0	0.07	200	0.18	65	0.21	140 <-> 320	0.27	90 <-> 270
982.5	0.08	220	0.19	65	0.21	135 <-> 315	0.28	85 <-> 265
983.0	0.08	185	0.20	60	0.22	135 <-> 315	0.30	60 <-> 240
983.5	0.17	201	0.23	20	0.39	21 <-> 201	0.42	115 <-> 295
984.0	0.16	240	0.24	20	0.37	95 <-> 275	0.42	165 <-> 345
984.5	0.18	340	0.21	260	0.39	50 <-> 230	0.41	80 <-> 260
985.0	0.15	10	0.24	245	0.36	10 <-> 190	0.42	130 <-> 310
985.5	0.15	120	0.24	245	0.35	0 <-> 180	0.39	65 <-> 245
986.0	0.14	130	0.24	265	0.34	175 <-> 355	0.40	120 <-> 300
986.5	0.11	30	0.29	250	0.31	150 <-> 330	0.41	70 <-> 250
987.0	0.10	75	0.30	245	0.30	145 <-> 325	0.41	65 <-> 245
987.5	0.12	85	0.27	250	0.32	146 <-> 326	0.39	65 <-> 245
988.0	0.11	5	0.29	235	0.32	160 <-> 340	0.40	55 <-> 235
988.5	0.09	15	0.29	245	0.30	146 <-> 326	0.41	65 <-> 245
989.0	0.10	5	0.28	245	0.31	141 <-> 321	0.40	65 <-> 245
989.5	0.10	10	0.30	230	0.30	146 <-> 326	0.42	60 <-> 240
990.0	0.11	10	0.28	205	0.31	131 <-> 311	0.41	50 <-> 230
990.5	0.11	5	0.28	250	0.31	146 <-> 326	0.42	70 <-> 250
991.0	0.10	0	0.28	235	0.31	136 <-> 316	0.42	60 <-> 240
991.5	0.11	16	0.29	235	0.29	136 <-> 316	0.43	55 <-> 235
992.0	0.09	10	0.29	215	0.28	146 <-> 326	0.46	65 <-> 245
992.5	0.10	5	0.30	235	0.27	146 <-> 326	0.44	55 <-> 235
993.0	0.10	0	0.29	220	0.26	142 <-> 322	0.45	45 <-> 225
993.5	0.09	355	0.32	245	0.25	156 <-> 336	0.47	65 <-> 245
994.0	0.10	0	0.31	240	0.27	146 <-> 326	0.45	60 <-> 240
994.5	0.11	0	0.40	200	0.32	106 <-> 286	0.53	20 <-> 200
995.0	0.08	90	0.42	220	0.26	131 <-> 311	0.52	40 <-> 220
995.5	0.07	336	0.40	215	0.22	121 <-> 301	0.50	35 <-> 215
996.0	0.07	91	0.42	215	0.17	121 <-> 301	0.51	35 <-> 215
996.5	0.06	100	0.41	230	0.13	128 <-> 308	0.52	50 <-> 230
997.0	0.04	312	0.40	215	0.14	132 <-> 312	0.50	40 <-> 220
997.5	0.08	90	0.42	220	0.28	111 <-> 291	0.53	40 <-> 220
998.0	0.06	350	0.38	215	0.22	131 <-> 311	0.51	45 <-> 225
998.5	0.05	70	0.38	220	0.18	126 <-> 306	0.49	40 <-> 220
999.0	0.03	70	0.37	220	0.14	123 <-> 303	0.46	25 <-> 205
999.5	0.03	15	0.35	215	0.14	126 <-> 306	0.44	50 <-> 230
1000.0	0.03	65	0.37	215	0.09	123 <-> 303	0.42	35 <-> 215
1000.5	0.02	331	0.37	230	0.09	126 <-> 306	0.40	40 <-> 220
1001.0	0.03	10	0.36	230	0.16	142 <-> 322	0.39	50 <-> 230
1001.5	0.04	50	0.34	220	0.19	128 <-> 308	0.38	40 <-> 220
1002.0	0.05	65	0.32	205	0.24	136 <-> 316	0.40	25 <-> 205
1002.5	0.11	75	0.27	240	0.32	165 <-> 345	0.39	55 <-> 235
1003.0	0.11	50	0.27	245	0.34	6 <-> 186	0.39	45 <-> 225
1003.5	0.11	65	0.29	250	0.34	171 <-> 351	0.39	65 <-> 245
1004.0	0.12	60	0.28	260	0.37	105 <-> 285	0.41	80 <-> 260
1004.5	0.11	60	0.28	240	0.35	171 <-> 351	0.40	90 <-> 270
1005.0	0.11	95	0.30	250	0.35	135 <-> 315	0.41	70 <-> 250
1005.5	0.11	75	0.29	245	0.36	151 <-> 331	0.40	55 <-> 235



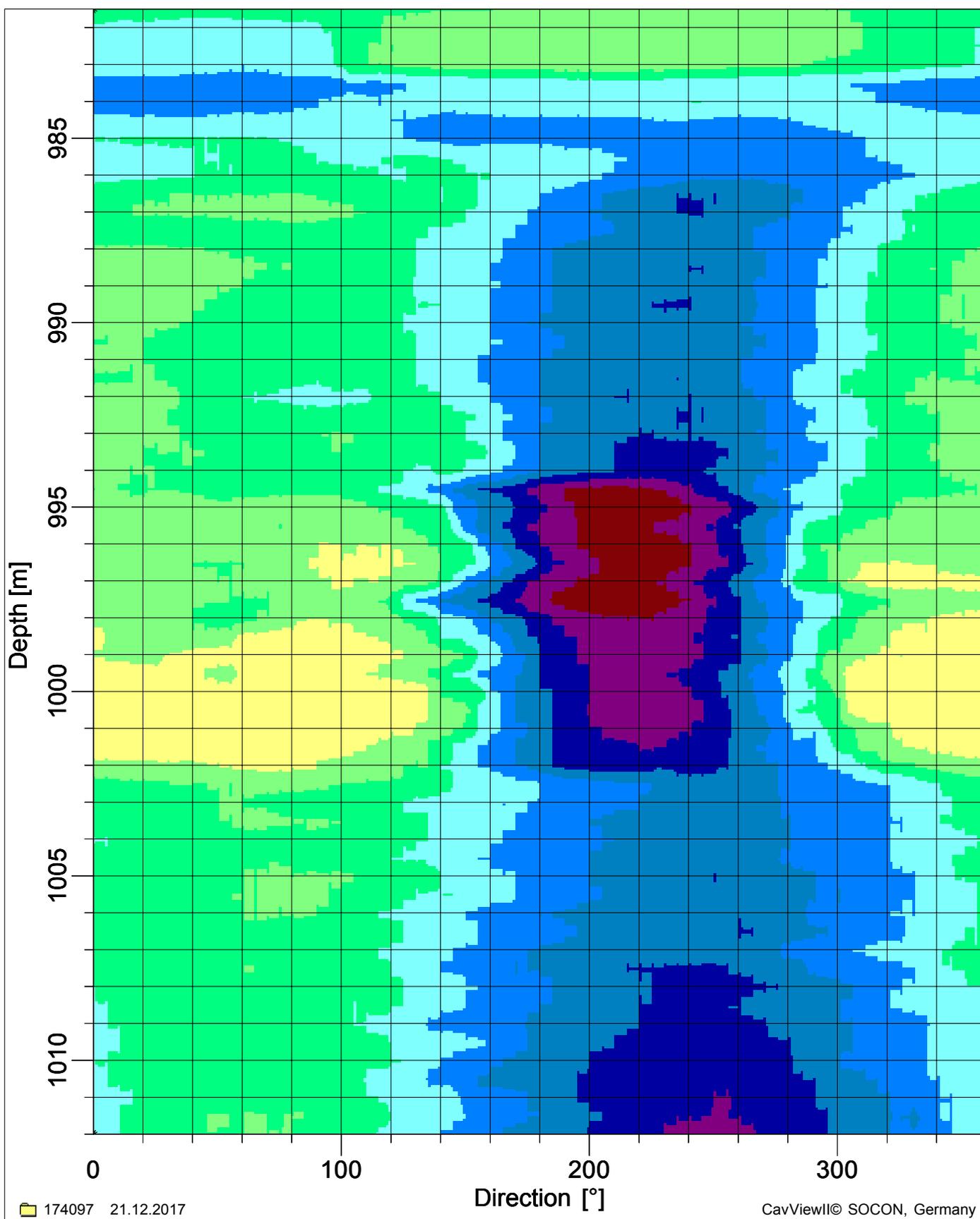
Table of radii and diameters

Cavity: Heiligerlee K

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21.12.2017

Depth [m]	Radius [MIN]		Radius [MAX]		Diameter [MIN]		Diameter [MAX]	
	[m]	[°]	[m]	[°]	[m]	[°]	[m]	[°]
1006.0	0.11	80	0.29	235	0.37	108 <-> 288	0.41	55 <-> 235
1006.5	0.12	60	0.30	260	0.37	118 <-> 298	0.42	80 <-> 260
1007.0	0.12	55	0.29	210	0.36	116 <-> 296	0.41	30 <-> 210
1007.5	0.11	60	0.30	245	0.38	158 <-> 338	0.42	70 <-> 250
1008.0	0.12	65	0.31	235	0.37	140 <-> 320	0.44	100 <-> 280
1008.5	0.13	35	0.31	240	0.38	132 <-> 312	0.44	70 <-> 250
1009.0	0.12	50	0.31	245	0.42	161 <-> 341	0.45	90 <-> 270
1009.5	0.12	50	0.32	245	0.39	156 <-> 336	0.45	75 <-> 255
1010.0	0.12	55	0.31	235	0.39	116 <-> 296	0.46	100 <-> 280
1010.5	0.13	45	0.33	250	0.43	105 <-> 285	0.49	70 <-> 250
1011.0	0.12	80	0.35	255	0.41	145 <-> 325	0.48	75 <-> 255
1011.5	0.11	45	0.36	250	0.41	1 <-> 181	0.48	150 <-> 330
1012.0	0.11	70	0.35	250	0.43	122 <-> 302	0.47	155 <-> 335



0.02 - 0.07 m	0.07 - 0.11 m	0.11 - 0.16 m	0.16 - 0.20 m	0.20 - 0.25 m
0.25 - 0.29 m	0.29 - 0.34 m	0.34 - 0.38 m	0.38 - 0.42 m	



Heiligerlee K --> 0° <--



Heiligerlee K --> 60° <--



Heiligerlee K --> 120° <--



Heiligerlee K --> 180° <--



Heiligerlee K --> 240° <--



Heiligerlee K --> 300° <--



HORIZONTAL SECTIONS

Cavity: Heiligerlee K

Report No.: 174 097

Utilized speed of sound.: 406.7 m/s to 407.0 m/s

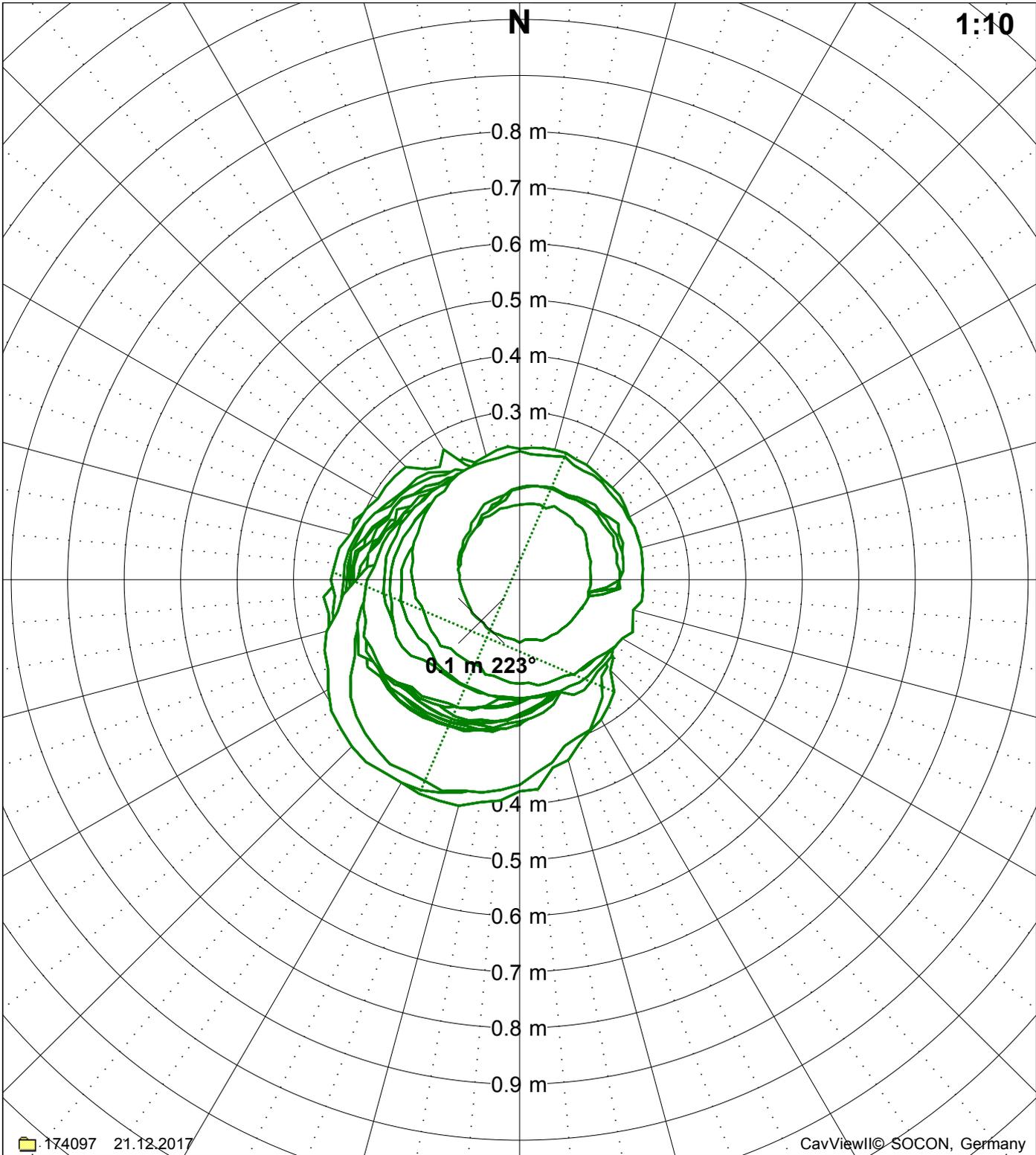
Measuring date: 21.12.2017

Scale: 1 : 10

Horizontal sections measured at following depths:

981.5 m	982.0 m	982.5 m	983.0 m	983.5 m	984.0 m	984.5 m
985.0 m	985.5 m	986.0 m	986.5 m	987.0 m	987.5 m	988.0 m
988.5 m	989.0 m	989.5 m	990.0 m	990.5 m	991.0 m	991.5 m
992.0 m	992.5 m	993.0 m	993.5 m	994.0 m	994.5 m	995.0 m
995.5 m	996.0 m	996.5 m	997.0 m	997.5 m	998.0 m	998.5 m
999.0 m	999.5 m	1000.0 m	1000.5 m	1001.0 m	1001.5 m	1002.0 m
1002.5 m	1003.0 m	1003.5 m	1004.0 m	1004.5 m	1005.0 m	1005.5 m
1006.0 m	1006.5 m	1007.0 m	1007.5 m	1008.0 m	1008.5 m	1009.0 m
1009.5 m	1010.0 m	1010.5 m	1011.0 m	1011.5 m	1012.0 m	

Heiligerlee K **MAXPLOT** **21.12.2017**



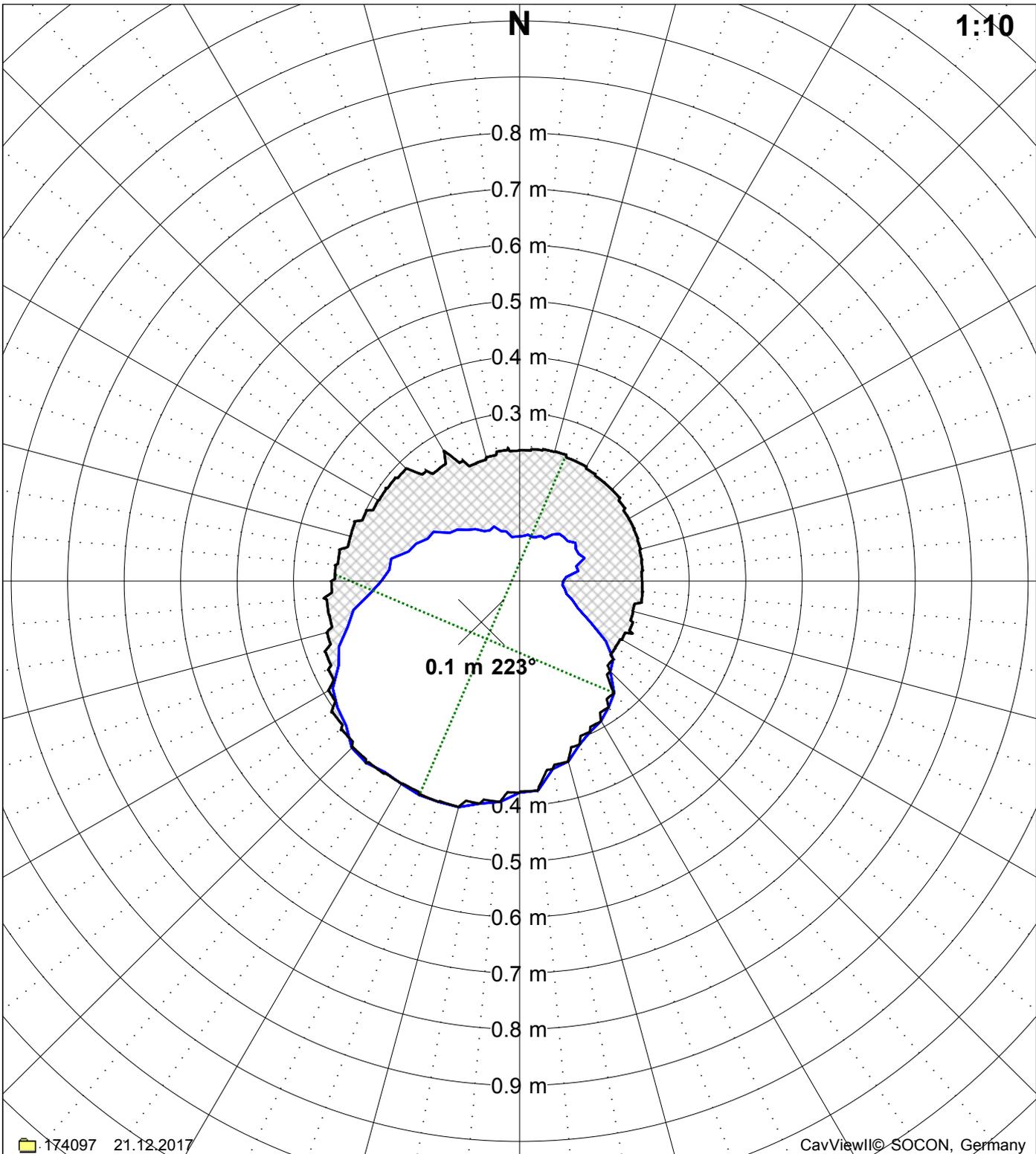
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 V-Maxplot (21.12.2017) (0.27 m ²)	 Horizontal sections	 a/b
 Center of gravity		

H/V-Maxplot: d_{\max} : 0.66 m $20^\circ \leftrightarrow 200^\circ$ r_{\min} : 0.21 m $\rightarrow 120^\circ$ r_{\sim} : 0.30 m r_{\max} : 0.42 m $\rightarrow 220^\circ$
 H/V-Maxplot: a/b = 1.231 a = 0.66 m (19°-205°) b = 0.54 m (139°-272°)
 Area from vertical sections: 0.27 m², Area from horizontal and vertical sections: 0.27 m²

Heiligerlee K **MAXPLOT** **21.12.2017**



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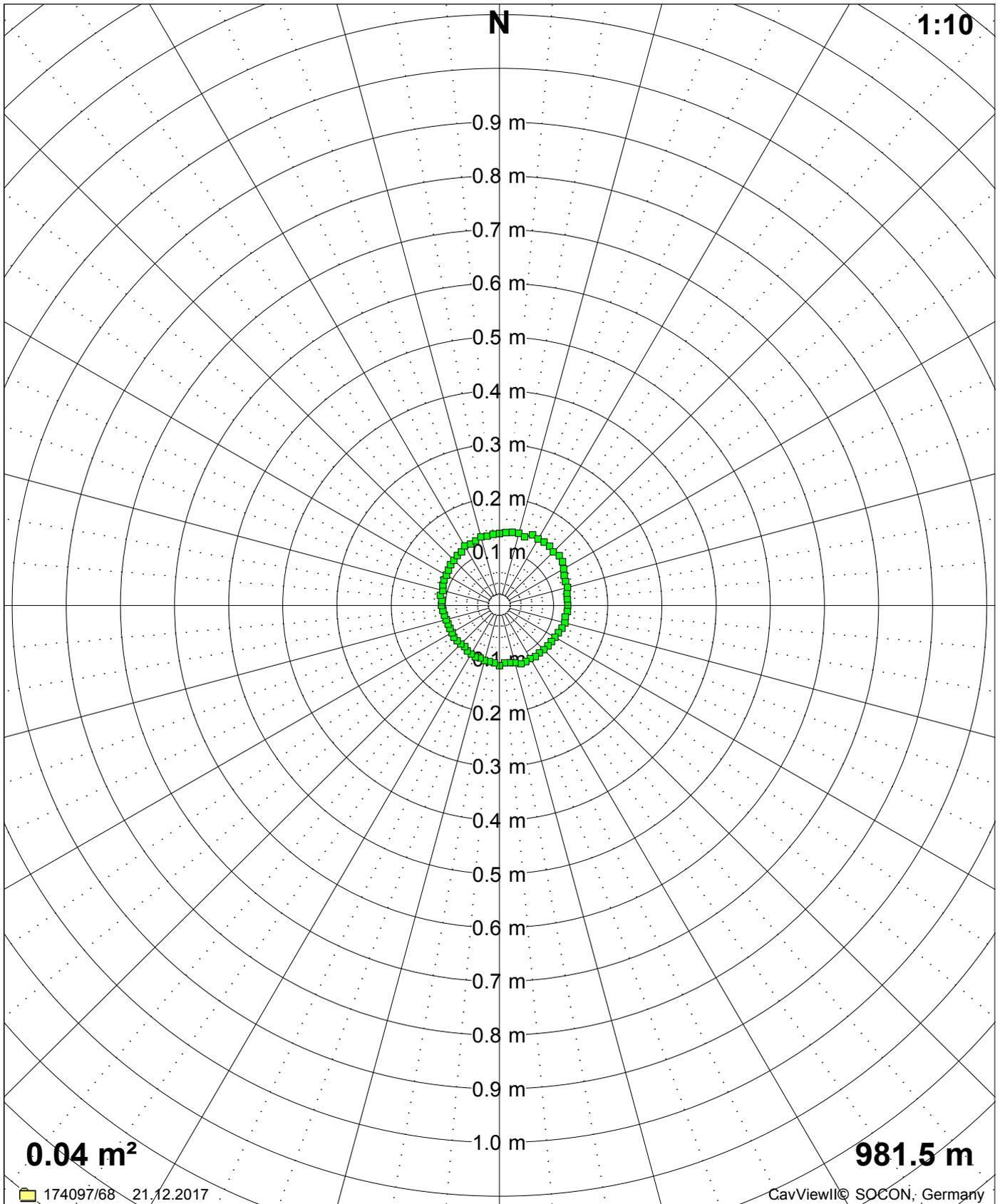
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 a/b	 Center of gravity	 H/V-Maxplot (21.12.2017) (0.27 m ²)
 Largest single area		

H/V-Maxplot: d_{\max} : 0.66 m 20° <--> 200° r_{\min} : 0.21 m -> 120° r_{\sim} : 0.30 m r_{\max} : 0.42 m -> 220°
 H/V-Maxplot: a/b = 1.231 a = 0.66 m (19°-205°) b = 0.54 m (139°-272°)
 Largest single area: 0.18 m² in depth: 997.5 m

Heiligerlee K

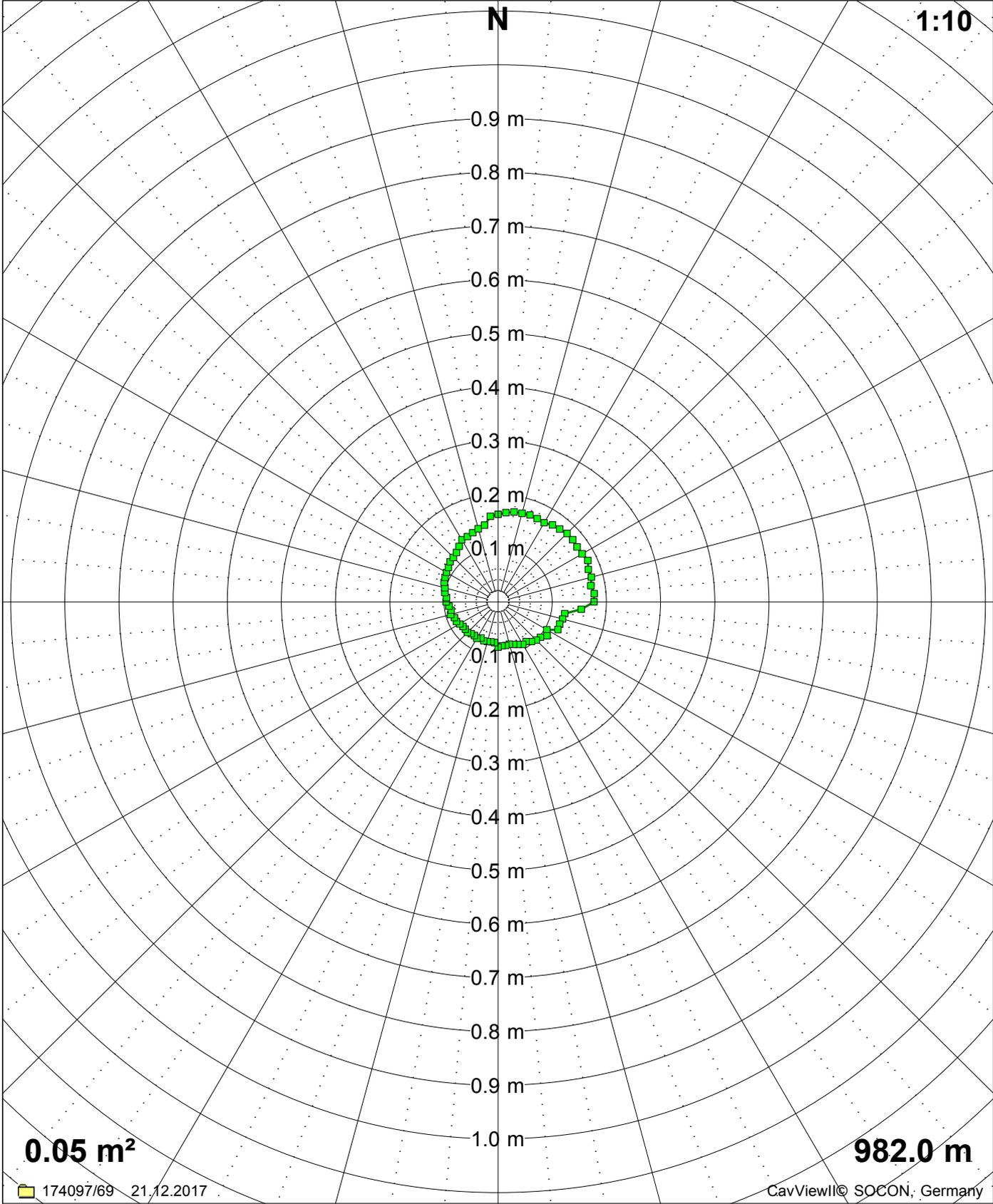
21.12.2017



—■— (21.12.2017) (0.04 m²)

d_{max} : 0.25 m 25° <--> 205° r_{min} : 0.10 m -> 215° r_{\sim} : 0.12 m r_{max} : 0.14 m -> 25°

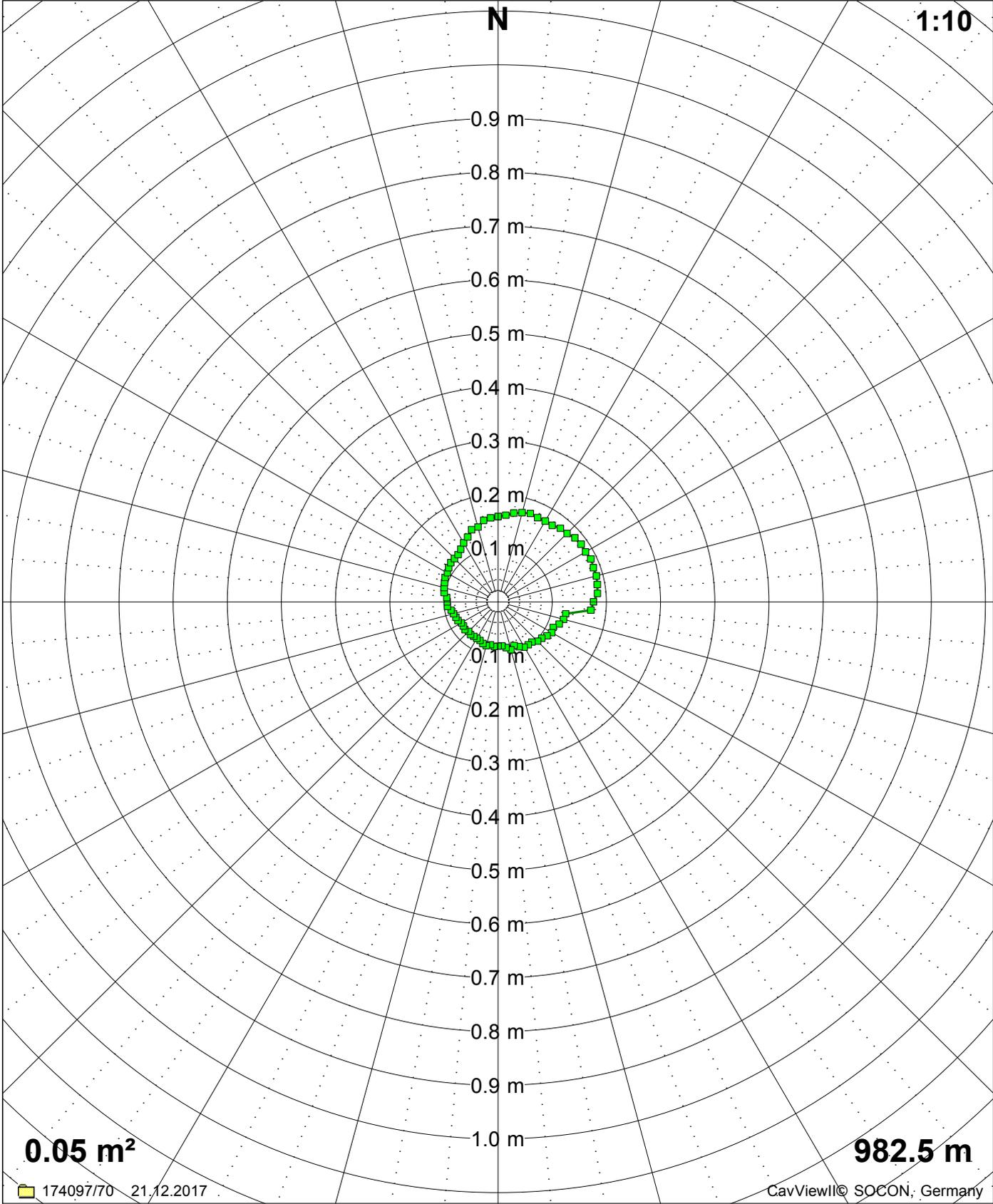
Heiligerlee K **21.12.2017**



 (21.12.2017) (0.05 m²)

d_{max} : 0.27 m 90° <--> 270° r_{min} : 0.07 m -> 200° r_{\sim} : 0.13 m r_{max} : 0.18 m -> 65°

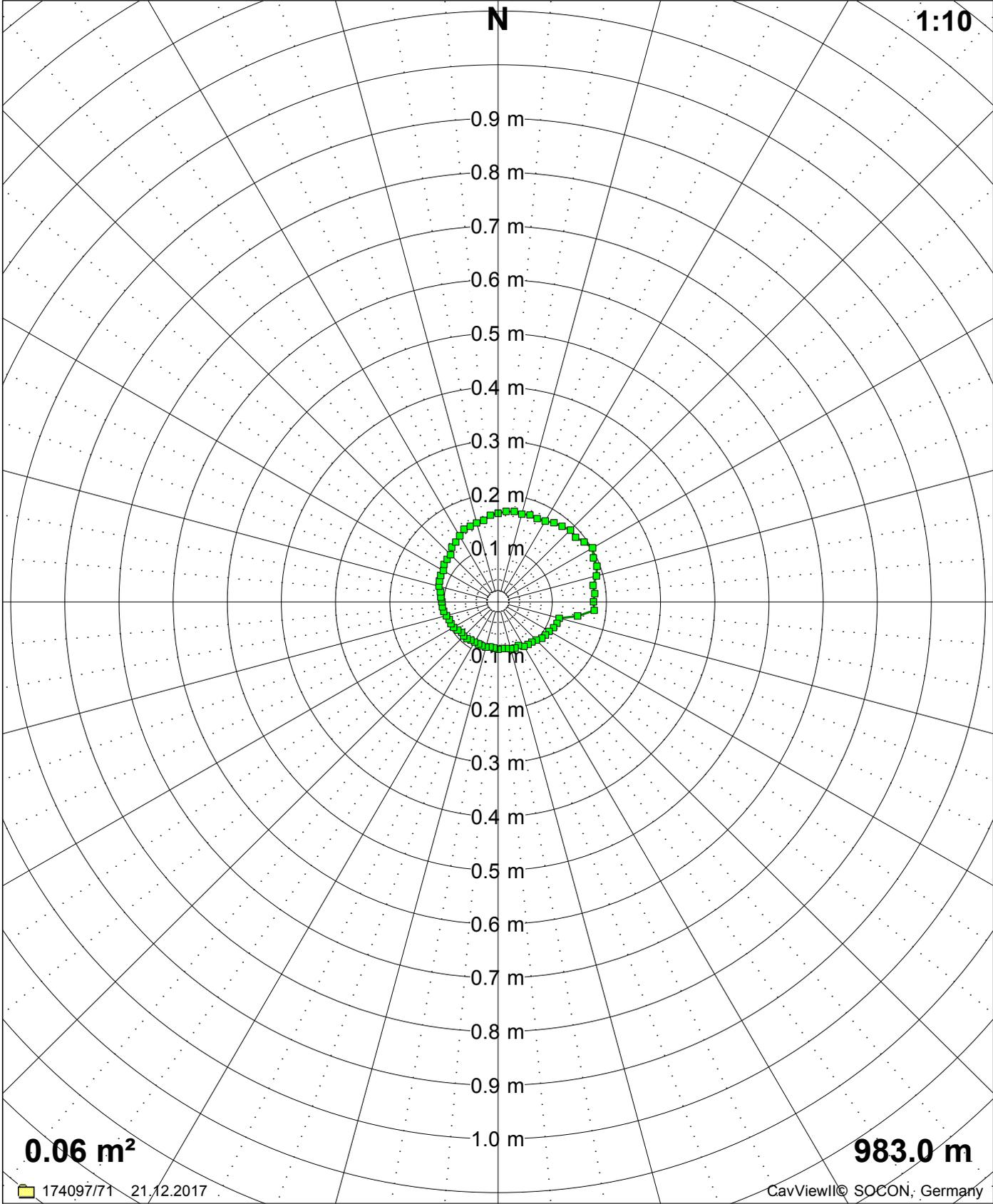
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.05 m²)

d_{max} : 0.28 m 85° <--> 265° r_{min} : 0.08 m -> 220° r_{\sim} : 0.13 m r_{max} : 0.19 m -> 65°

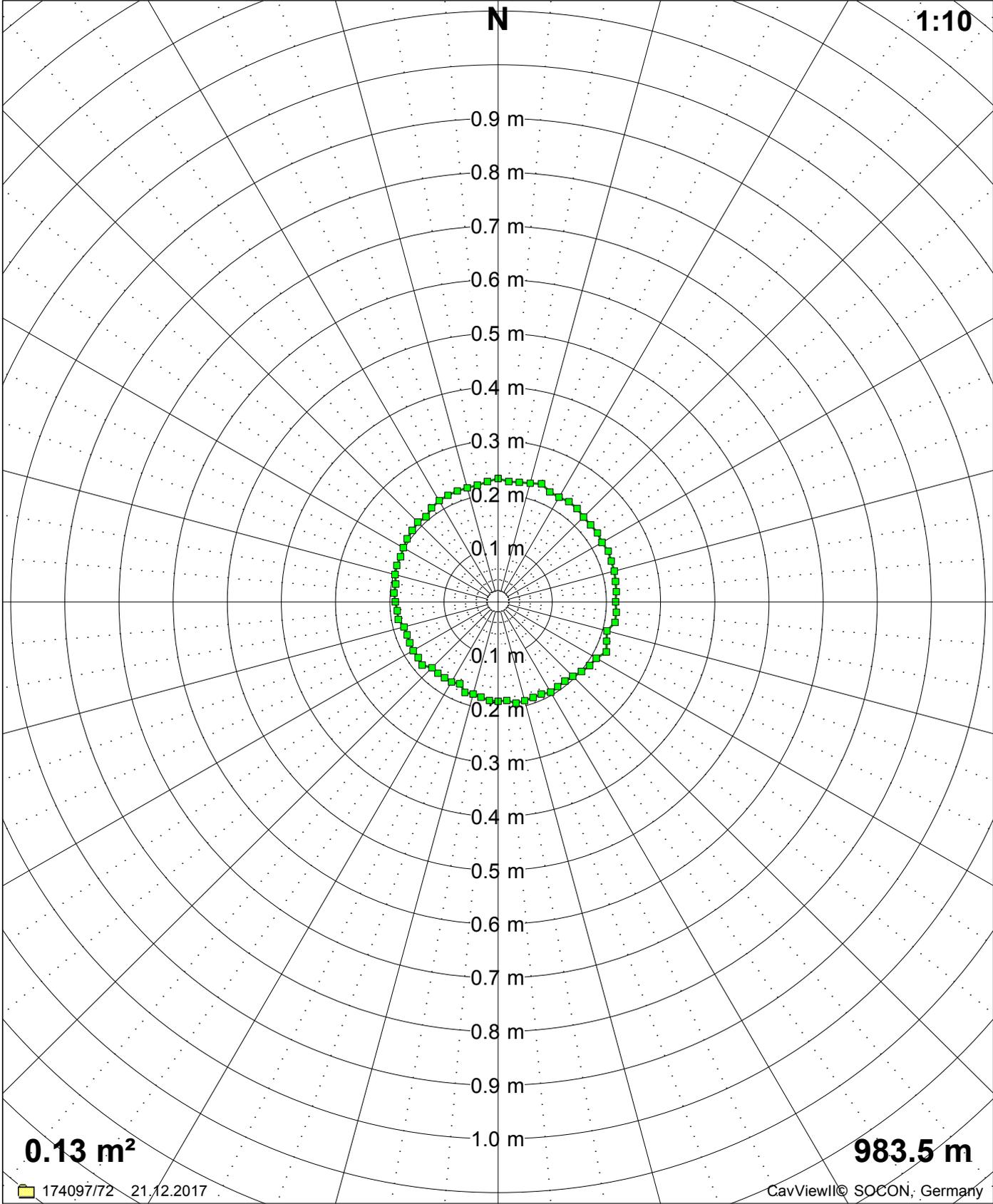
Heiligerlee K **21.12.2017**



 (21.12.2017) (0.06 m²)

d_{max} : 0.30 m 60° <--> 240° r_{min} : 0.08 m -> 185° r_{\sim} : 0.13 m r_{max} : 0.20 m -> 60°

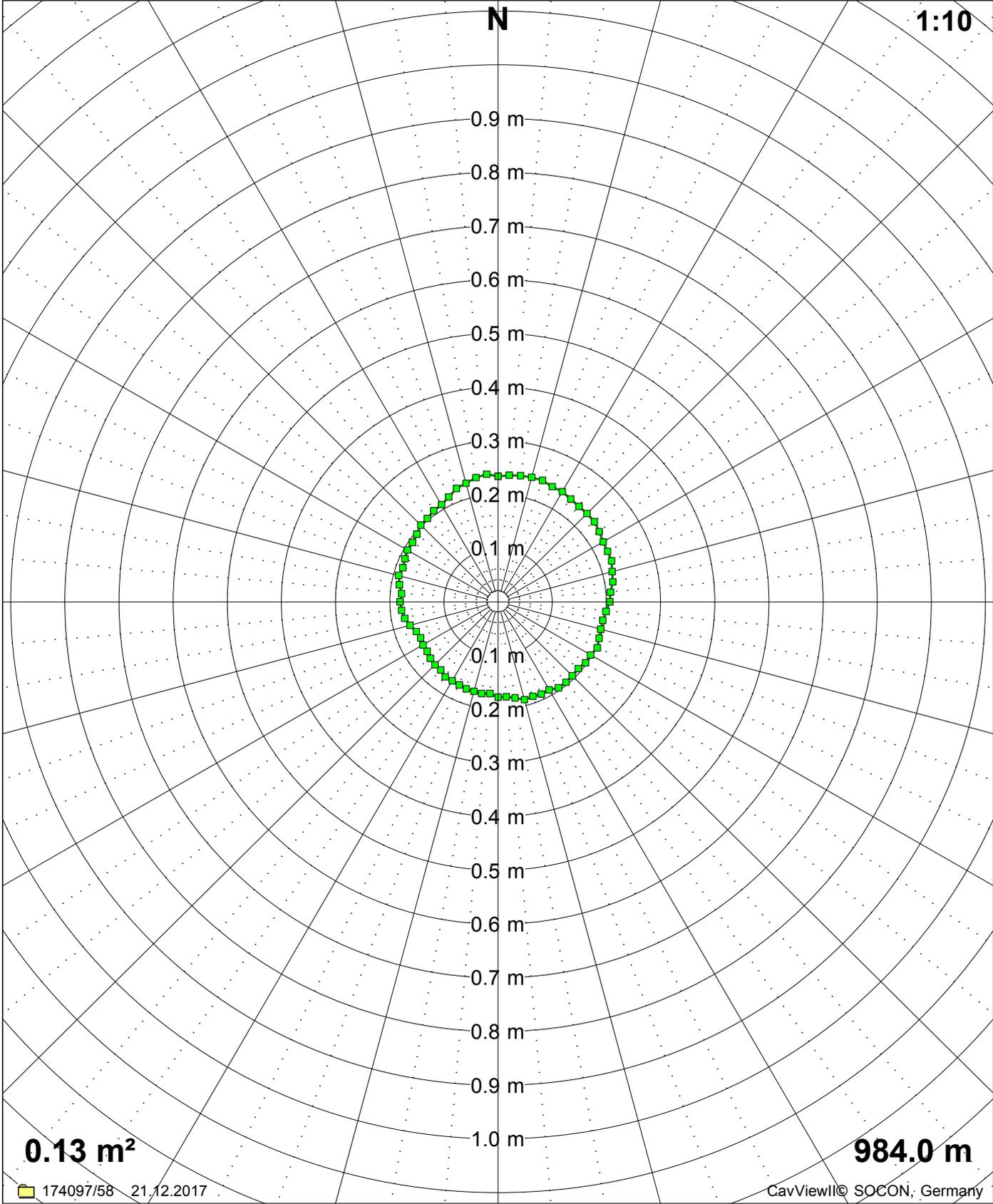
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.13 m²)

d_{max} : 0.42 m 115° <--> 295° r_{min} : 0.17 m -> 201° r_{\sim} : 0.20 m r_{max} : 0.23 m -> 20°

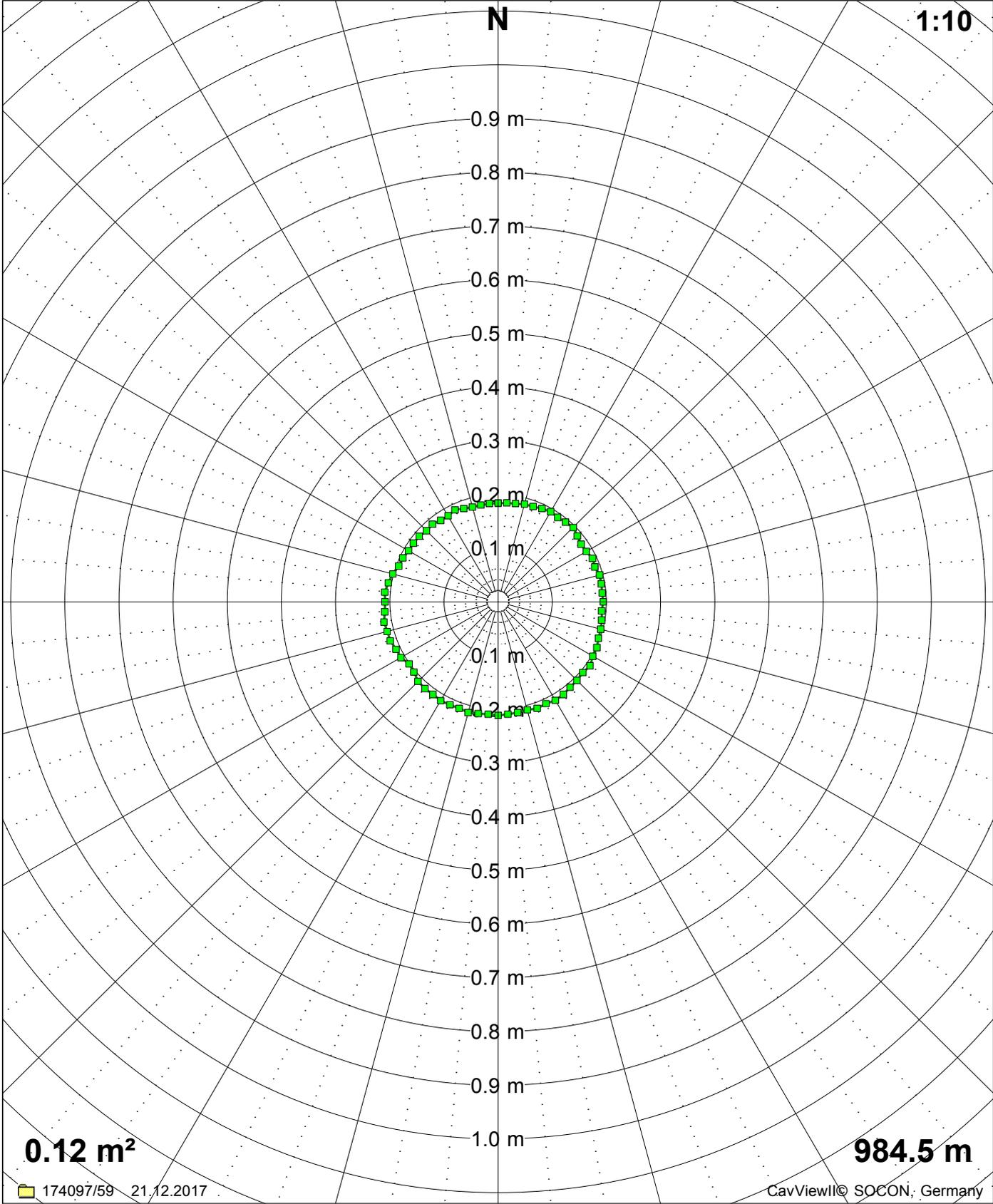
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.13 m²)

d_{max} : 0.42 m 165° <--> 345° r_{min} : 0.16 m -> 240° r_{\sim} : 0.20 m r_{max} : 0.24 m -> 20°

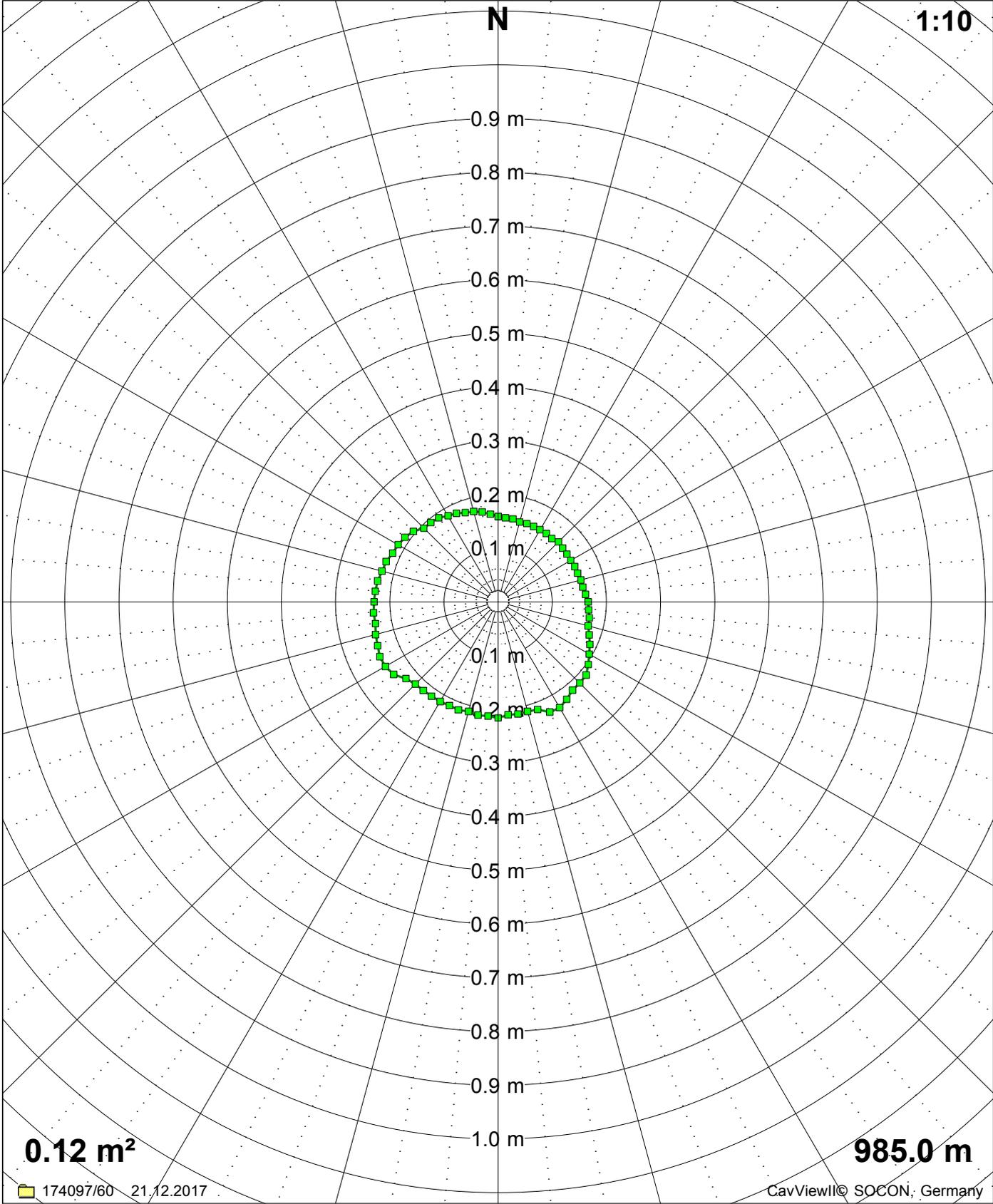
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.12 m²)

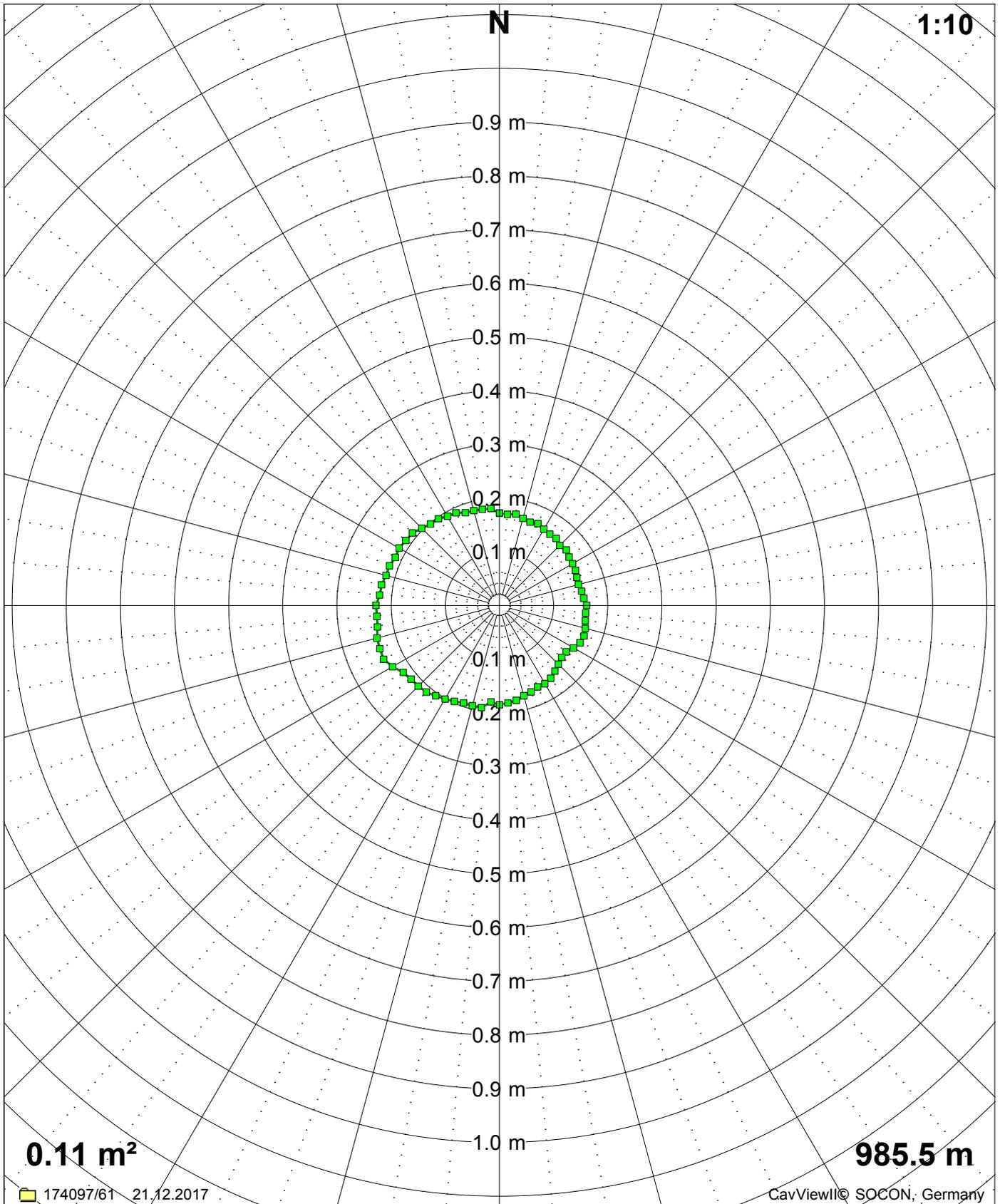
d_{max} : 0.41 m 80° <--> 260° r_{min} : 0.18 m -> 340° r_{\sim} : 0.20 m r_{max} : 0.21 m -> 260°

Heiligerlee K **21.12.2017**



Heiligerlee K

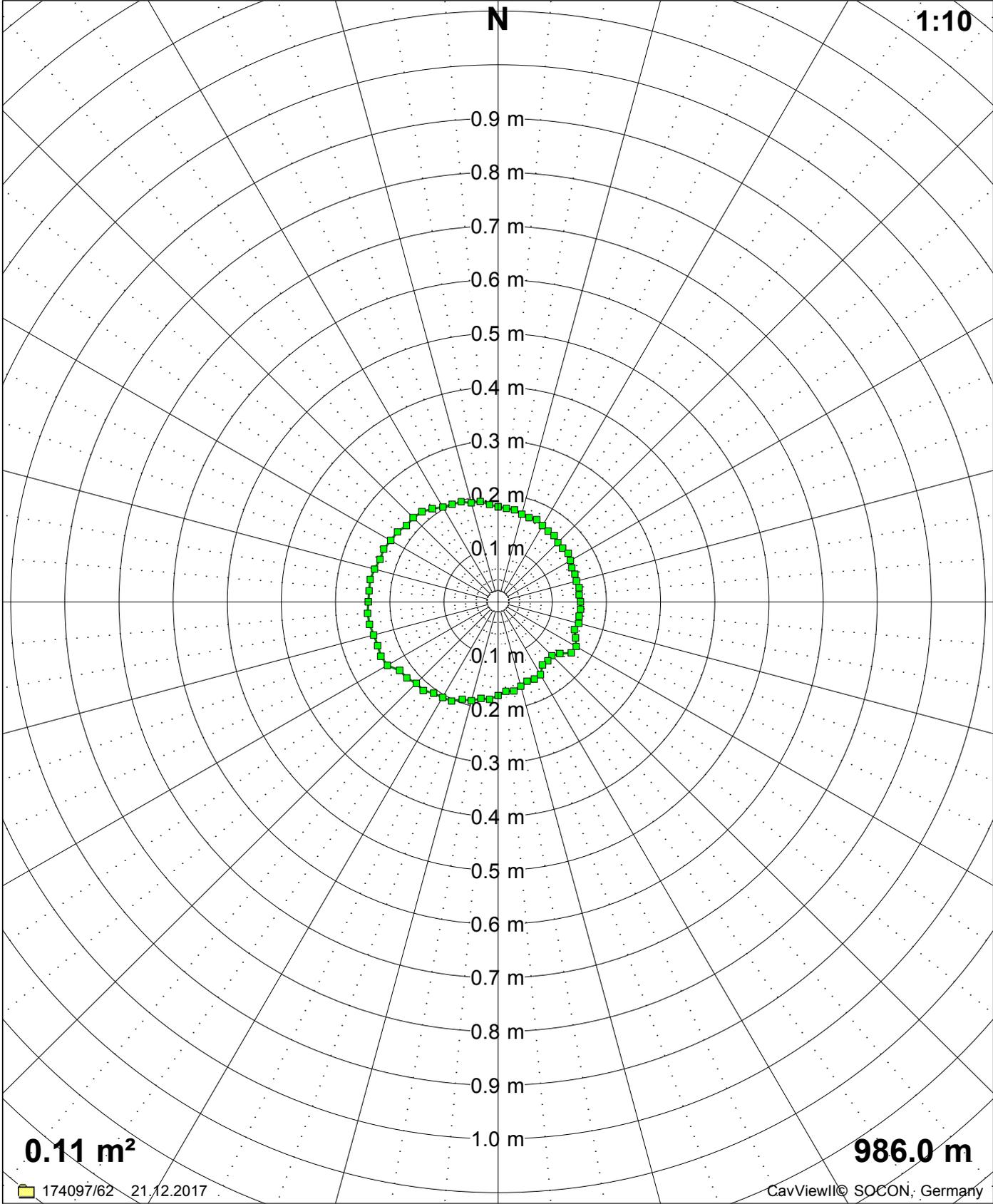
21.12.2017



—■— (21.12.2017) (0.11 m²)

d_{max} : 0.39 m 65° <--> 245° r_{min} : 0.15 m -> 120° r_{\sim} : 0.19 m r_{max} : 0.24 m -> 245°

Heiligerlee K **21.12.2017**

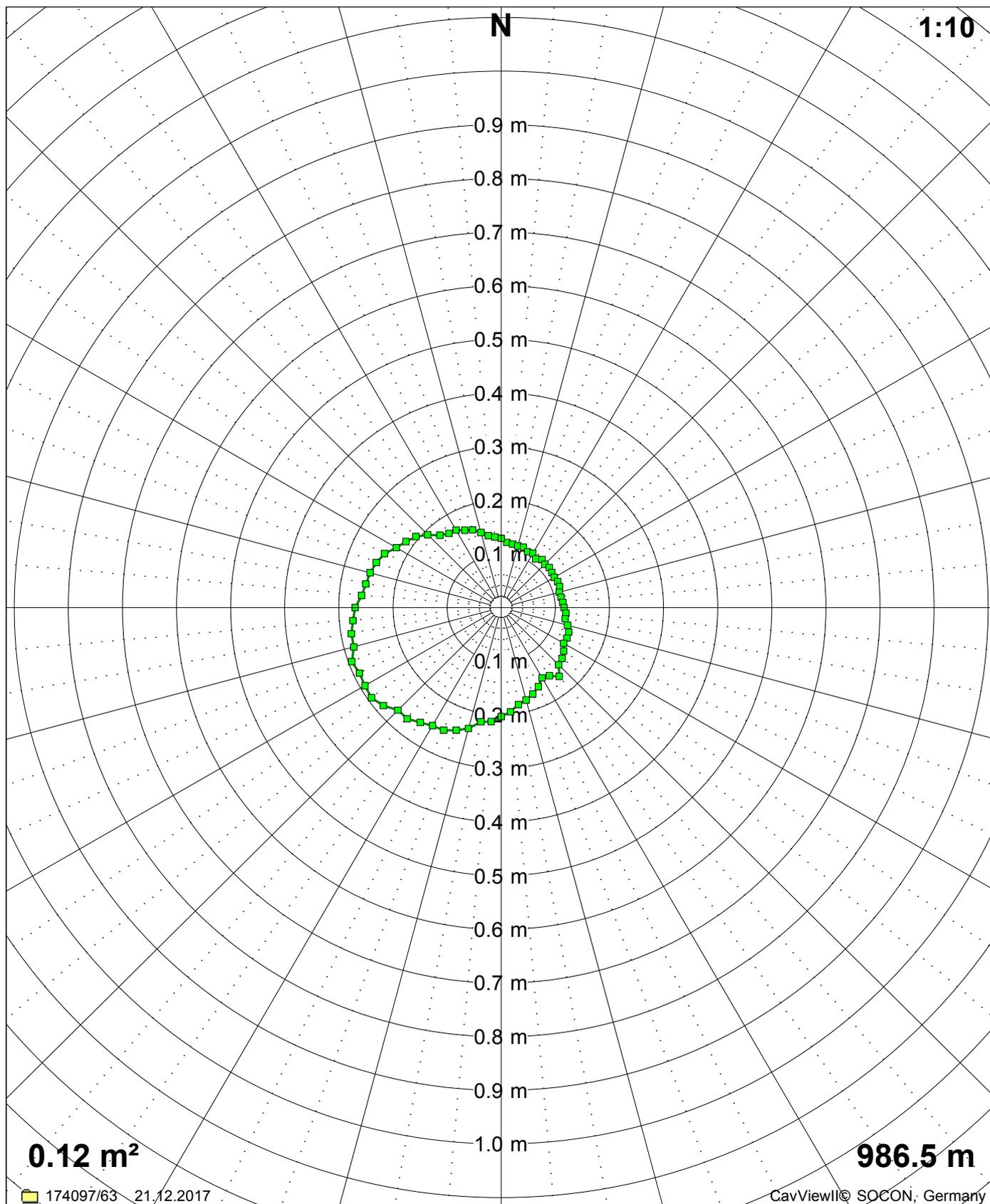


—■— (21.12.2017) (0.11 m²)

d_{max}: 0.40 m 120° <--> 300° r_{min}: 0.14 m -> 130° r~: 0.19 m r_{max}: 0.24 m -> 265°

Heiligerlee K

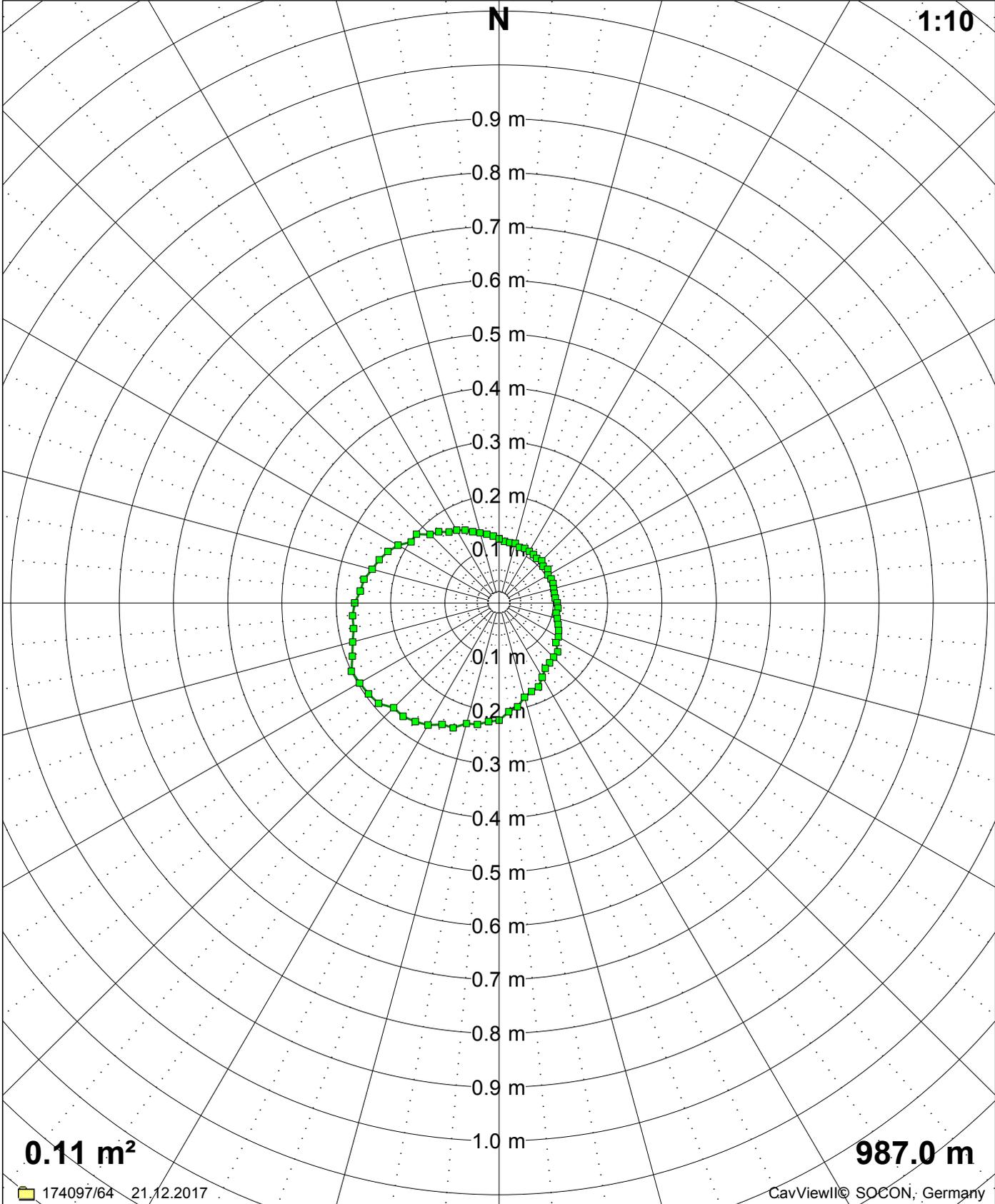
21.12.2017



—■— (21.12.2017) (0.12 m²)

d_{max} : 0.41 m 70° <--> 250° r_{min} : 0.11 m -> 30° r_{\sim} : 0.19 m r_{max} : 0.29 m -> 250°

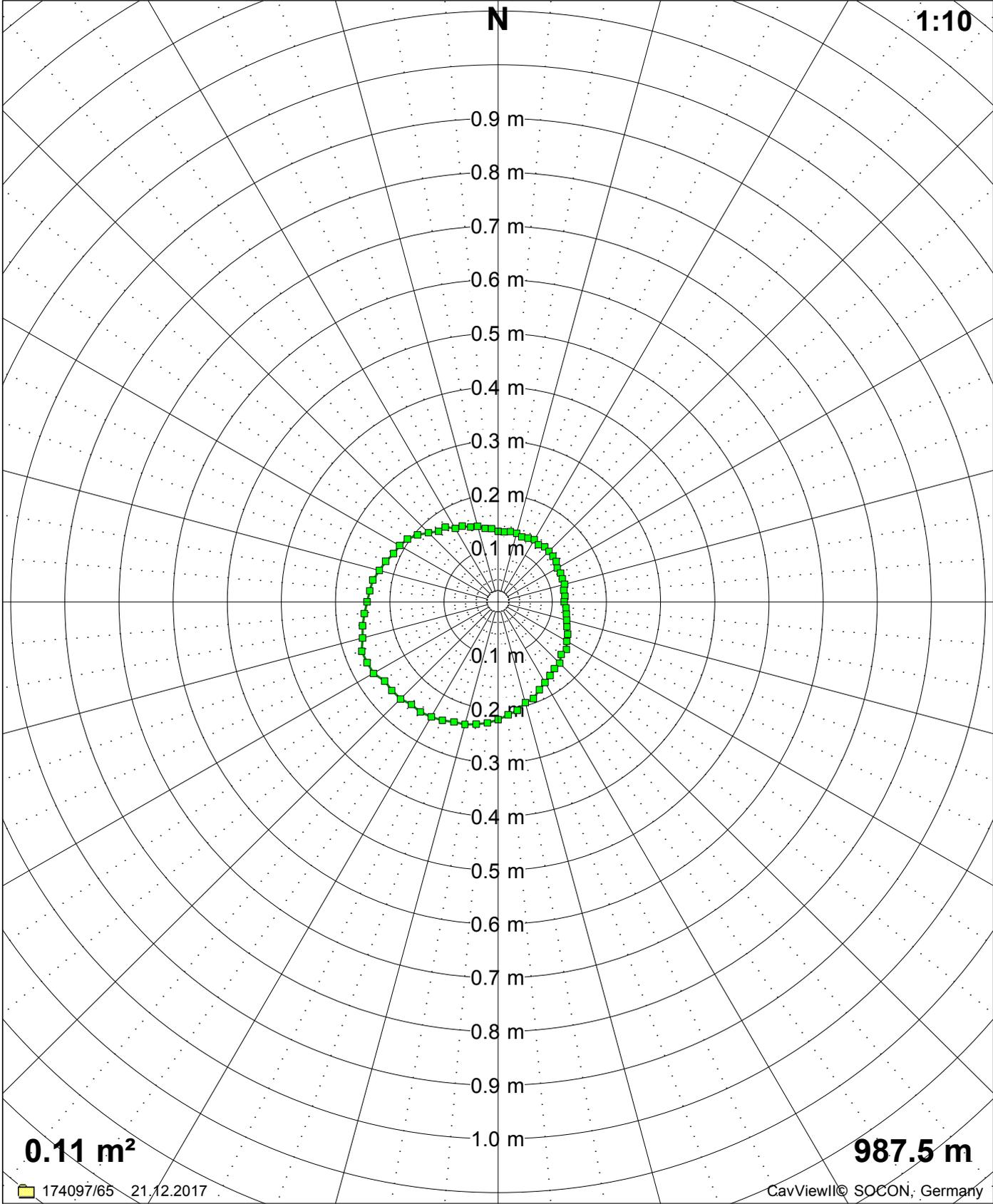
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.11 m²)

d_{max} : 0.41 m 65° <--> 245° r_{min} : 0.10 m -> 75° r_{\sim} : 0.19 m r_{max} : 0.30 m -> 245°

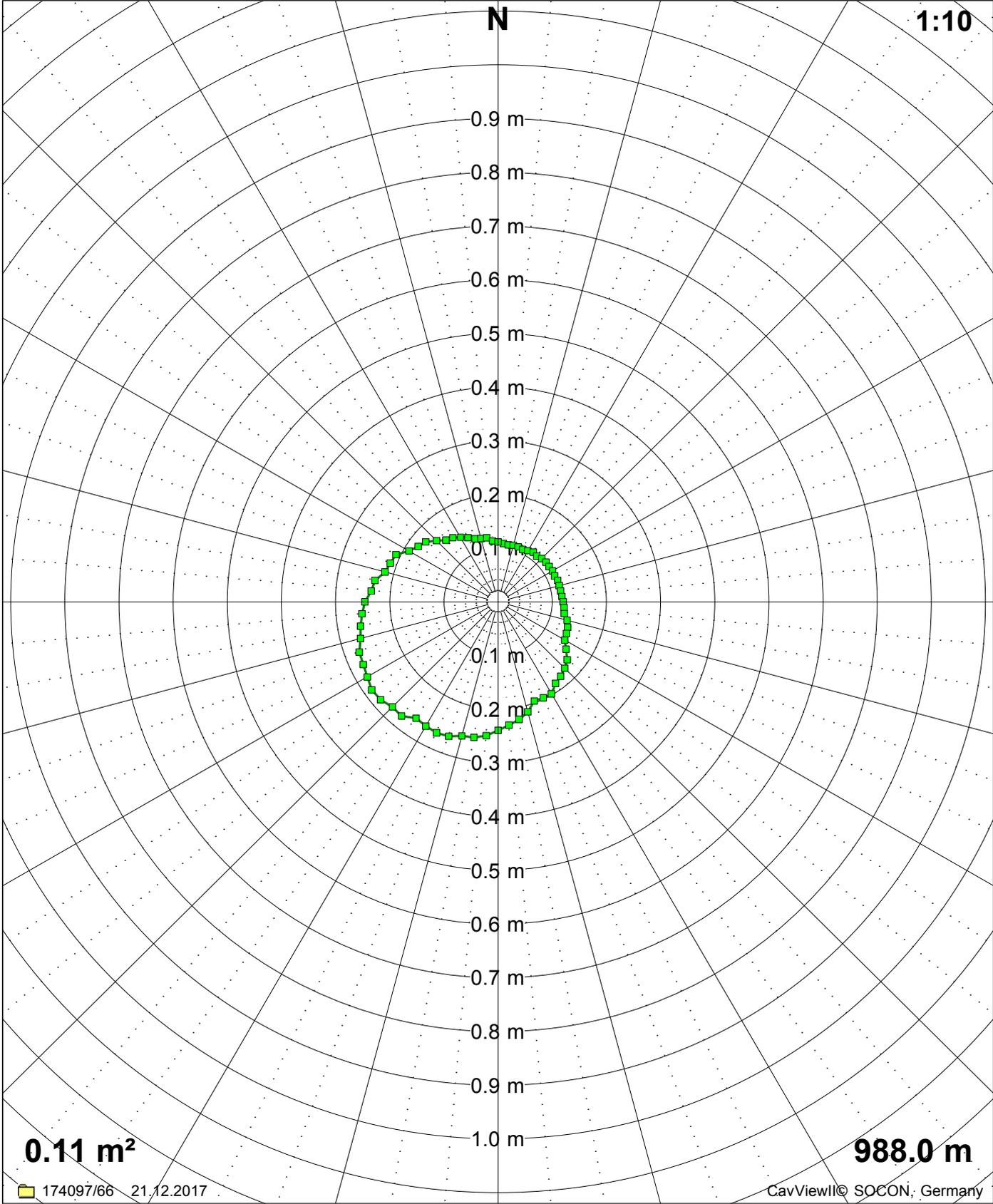
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.11 m²)

d_{\max} : 0.39 m 65° <--> 245° r_{\min} : 0.12 m -> 85° r_{\sim} : 0.19 m r_{\max} : 0.27 m -> 250°

Heiligerlee K **21.12.2017**

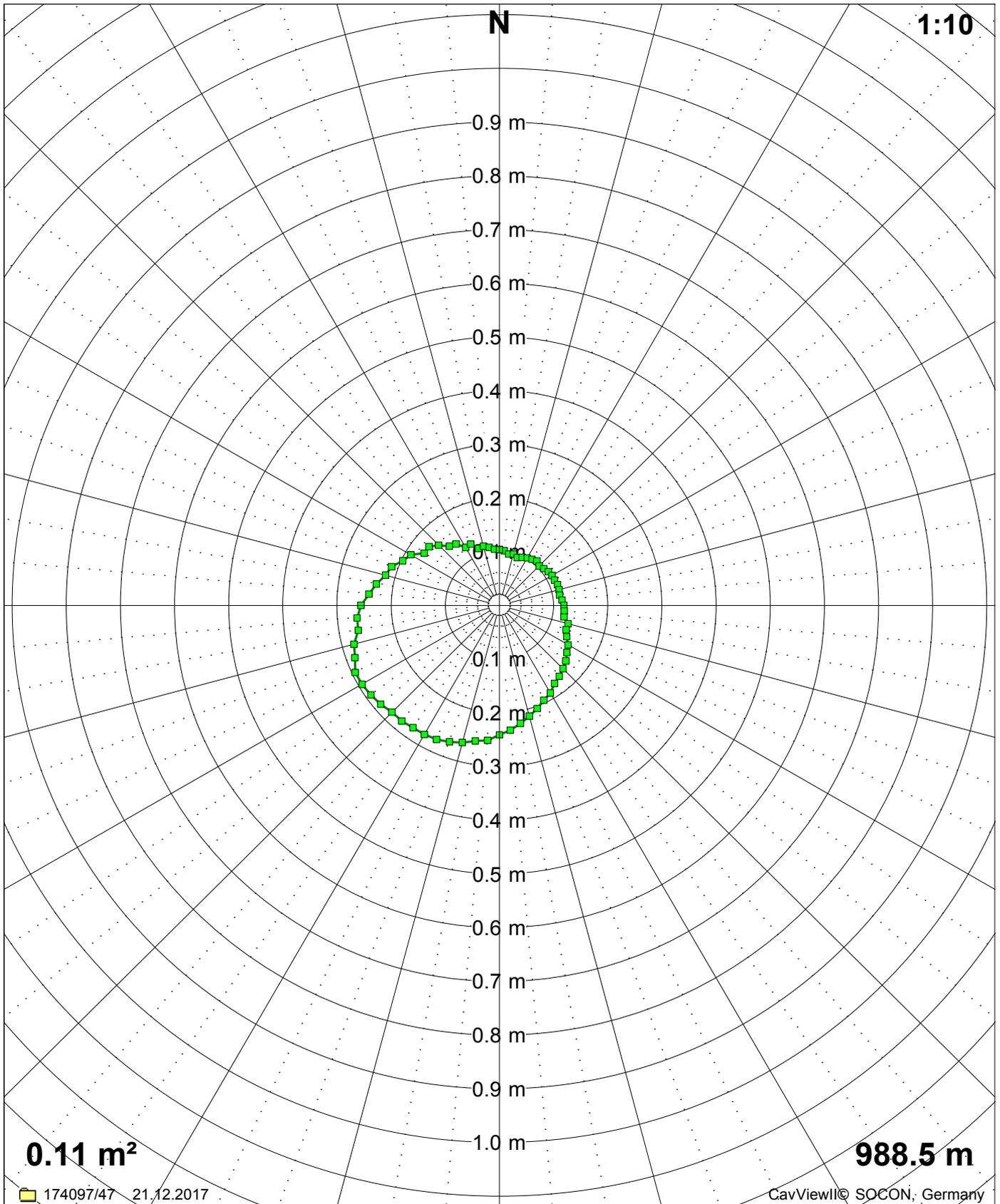


—■— (21.12.2017) (0.11 m²)

d_{max} : 0.40 m 55° <--> 235° r_{min} : 0.11 m -> 5° r_{\sim} : 0.19 m r_{max} : 0.28 m -> 235°

Heiligerlee K

21.12.2017

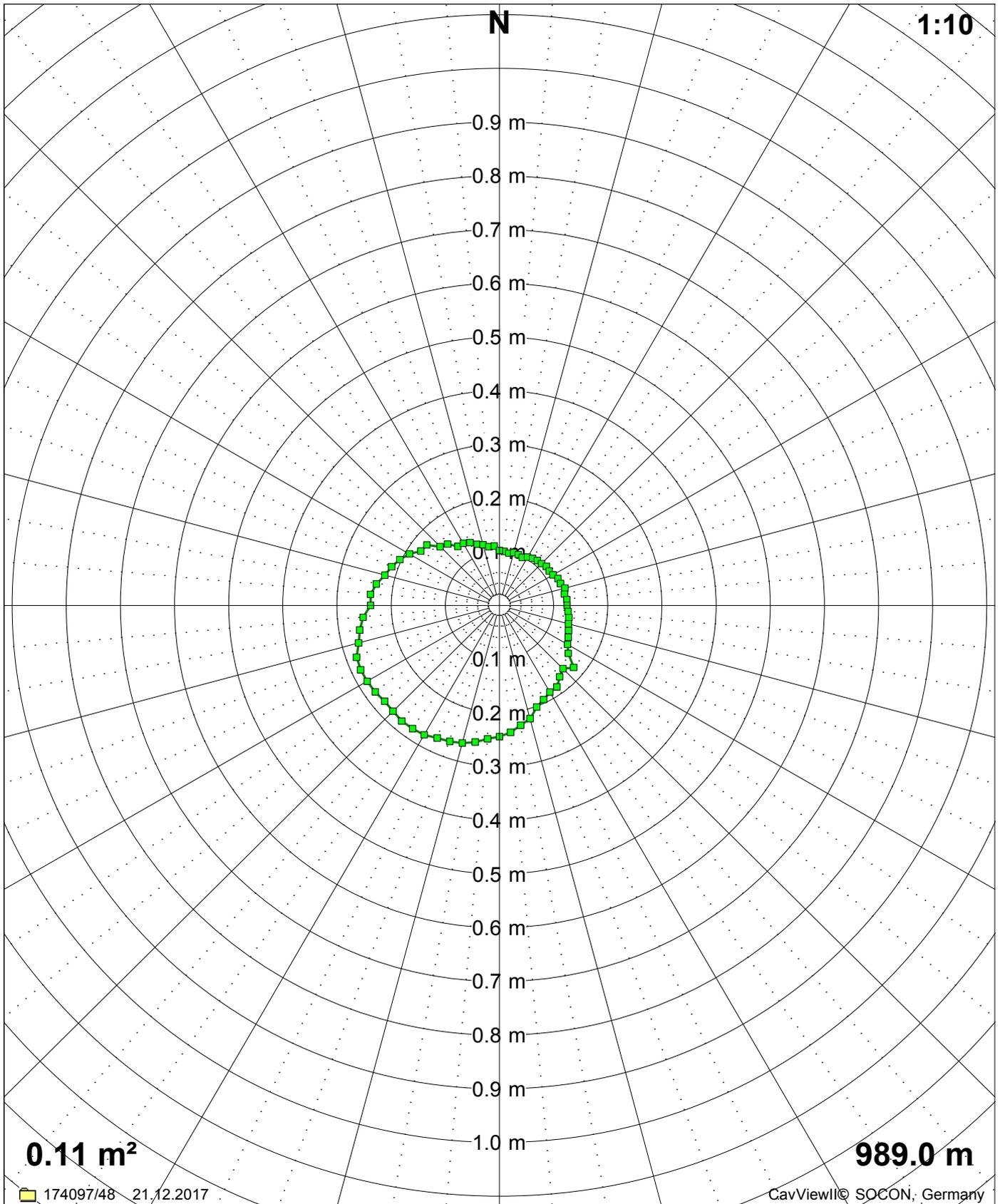


(21.12.2017) (0.11 m²)

d_{max} : 0.41 m 65° <--> 245° r_{min} : 0.09 m -> 15° r_{\sim} : 0.19 m r_{max} : 0.29 m -> 245°

Heiligerlee K

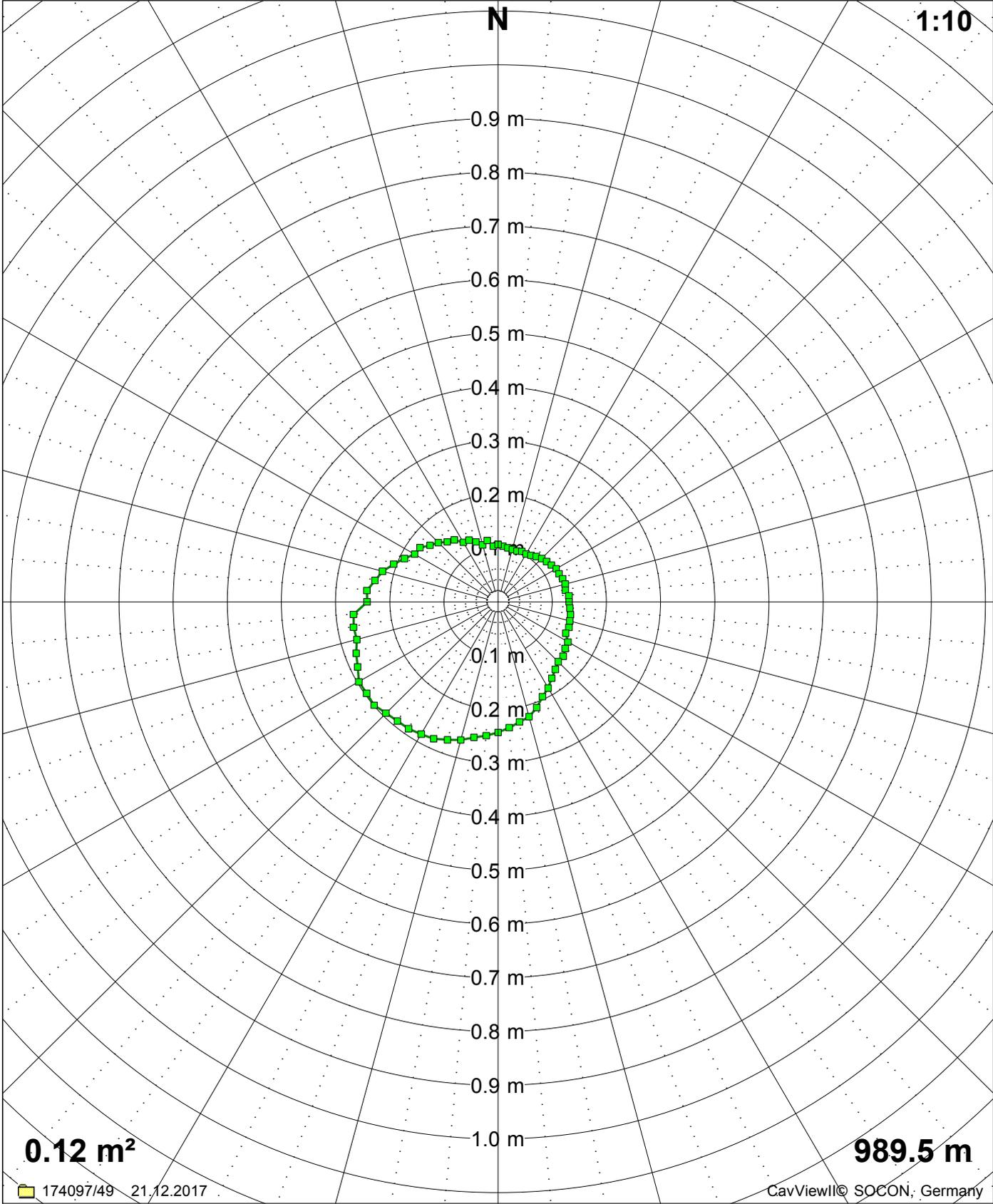
21.12.2017



—■— (21.12.2017) (0.11 m²)

d_{\max} : 0.40 m 65° <--> 245° r_{\min} : 0.10 m -> 5° r_{\sim} : 0.19 m r_{\max} : 0.28 m -> 245°

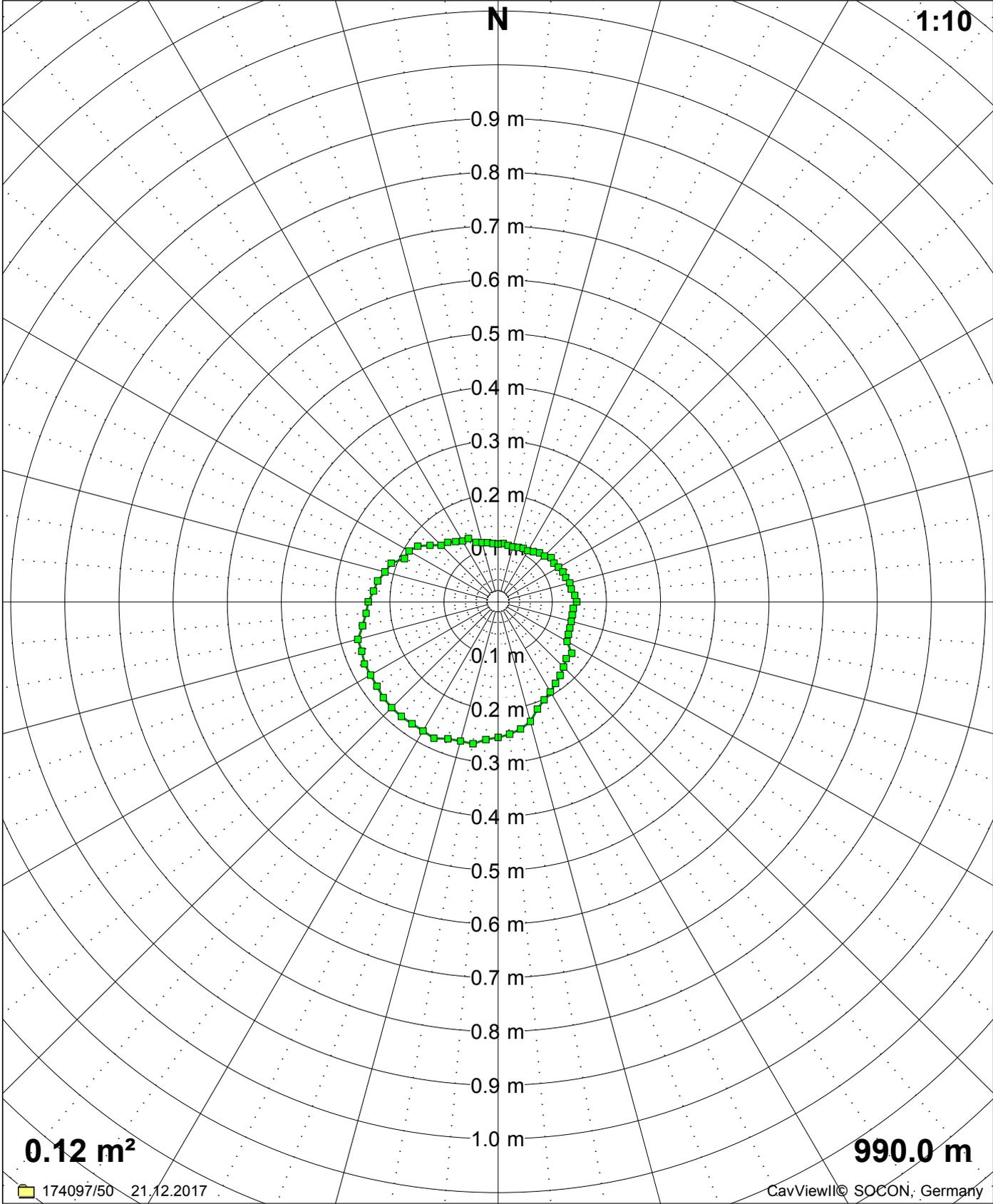
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.12 m²)

d_{max} : 0.42 m 60° <--> 240° r_{min} : 0.10 m -> 10° r_{\sim} : 0.19 m r_{max} : 0.30 m -> 230°

Heiligerlee K **21.12.2017**

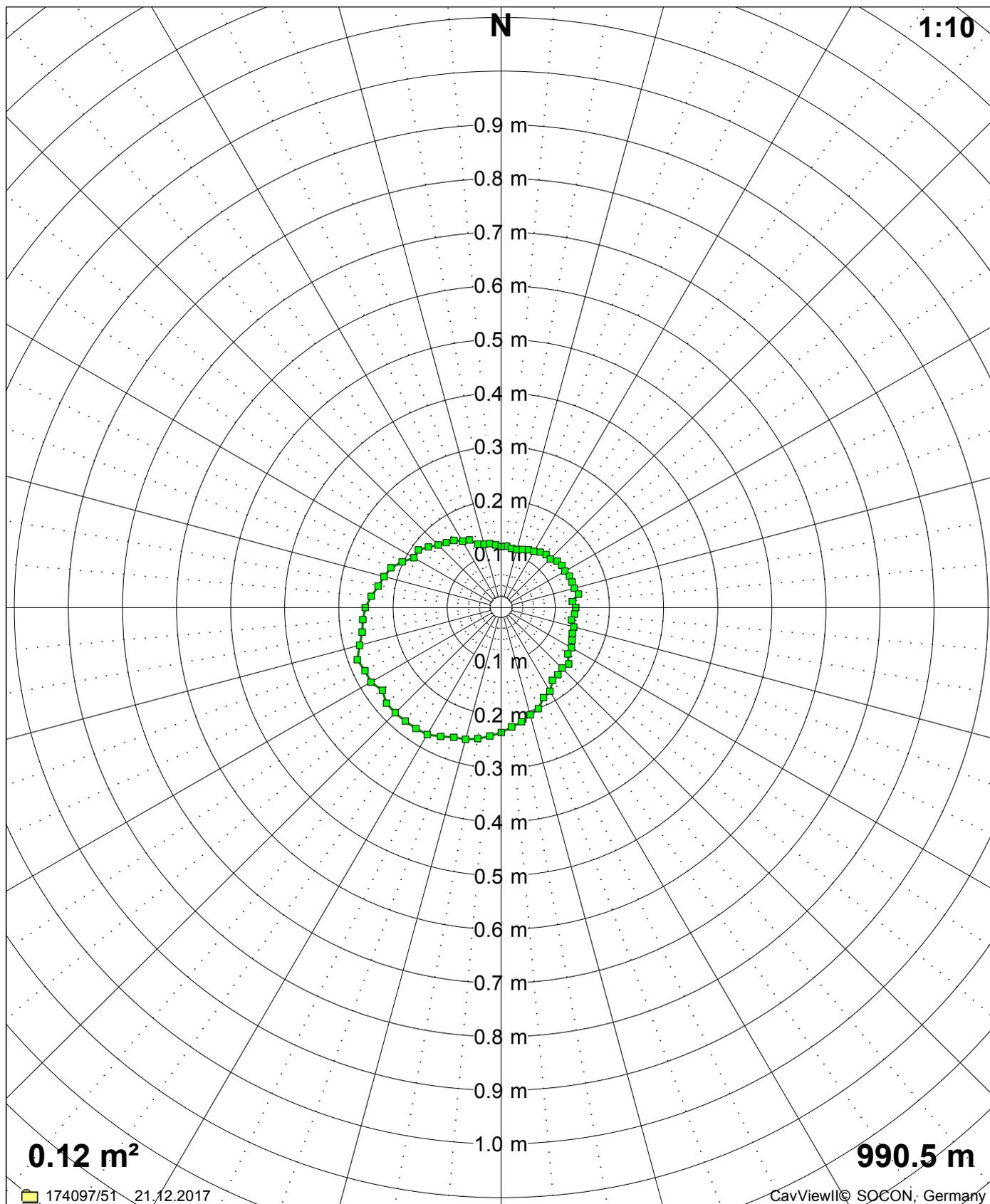


—■— (21.12.2017) (0.12 m²)

d_{max} : 0.41 m 50° <--> 230° r_{min} : 0.10 m -> 10° r_{\sim} : 0.19 m r_{max} : 0.28 m -> 205°

Heiligerlee K

21.12.2017

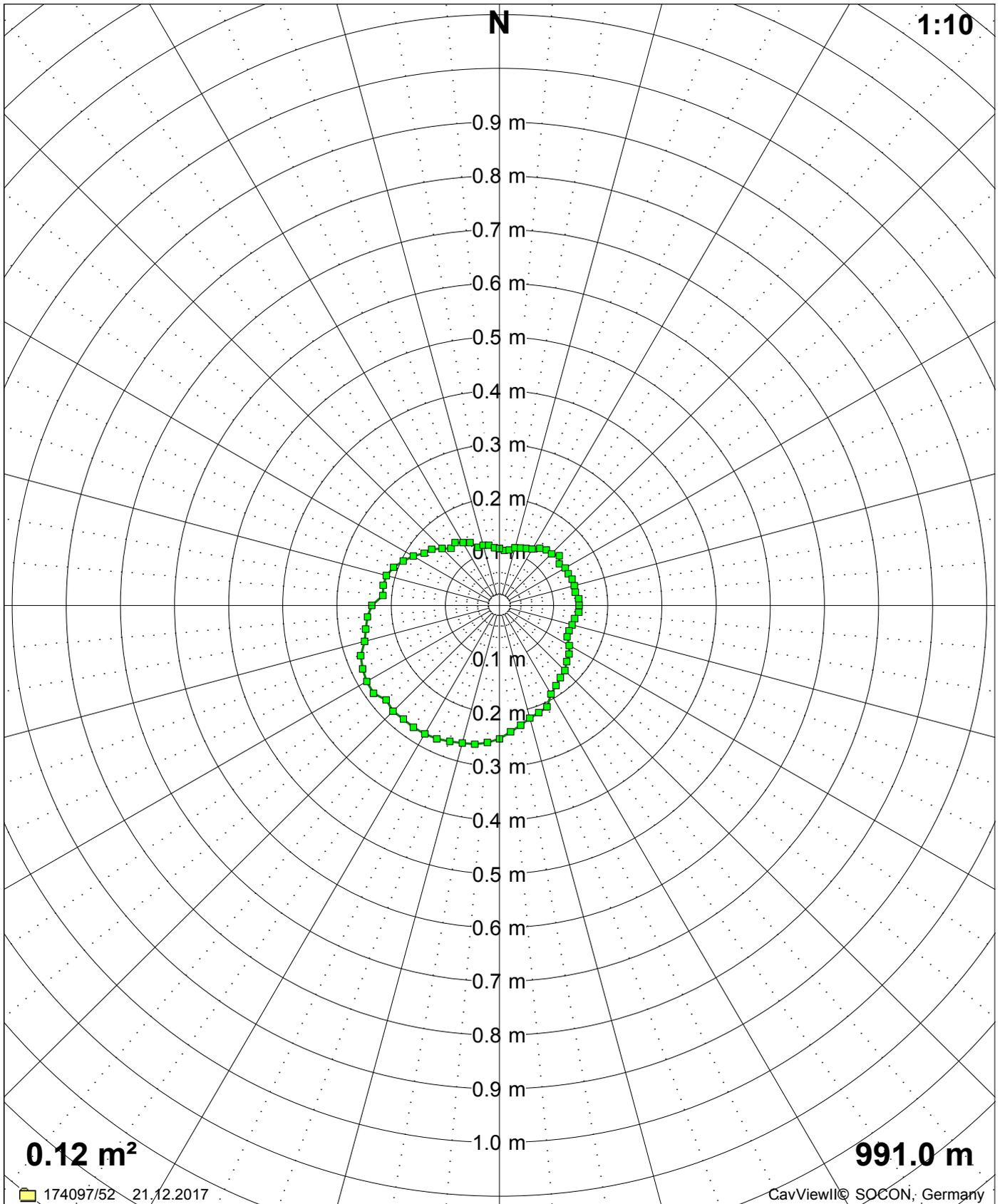


—■— (21.12.2017) (0.12 m²)

d_{max} : 0.42 m 70° <--> 250° r_{min} : 0.11 m -> 5° r_{\sim} : 0.19 m r_{max} : 0.28 m -> 250°

Heiligerlee K

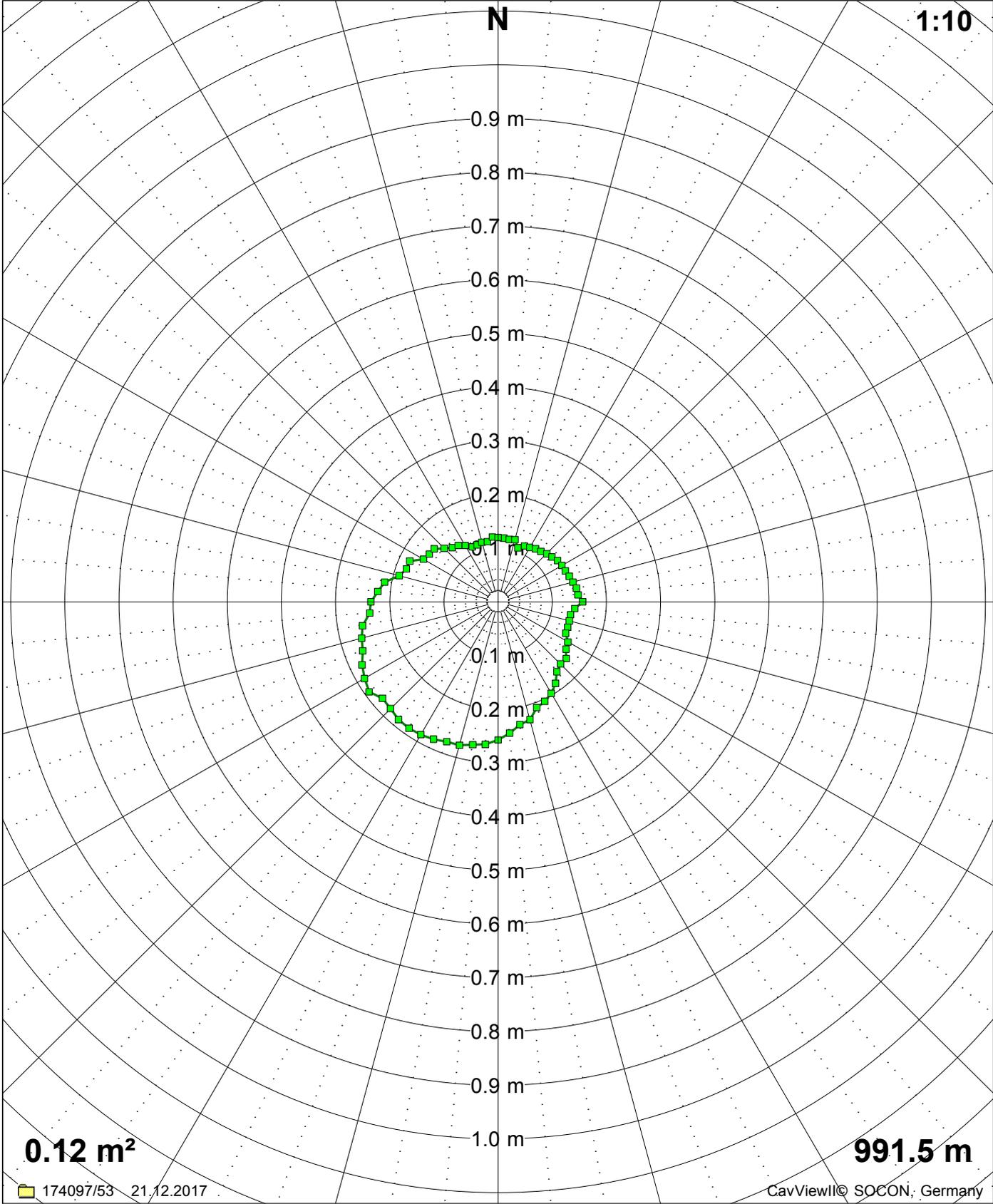
21.12.2017



—■— (21.12.2017) (0.12 m²)

d_{max} : 0.42 m 60° <--> 240° r_{min} : 0.10 m -> 0° r_{\sim} : 0.19 m r_{max} : 0.28 m -> 235°

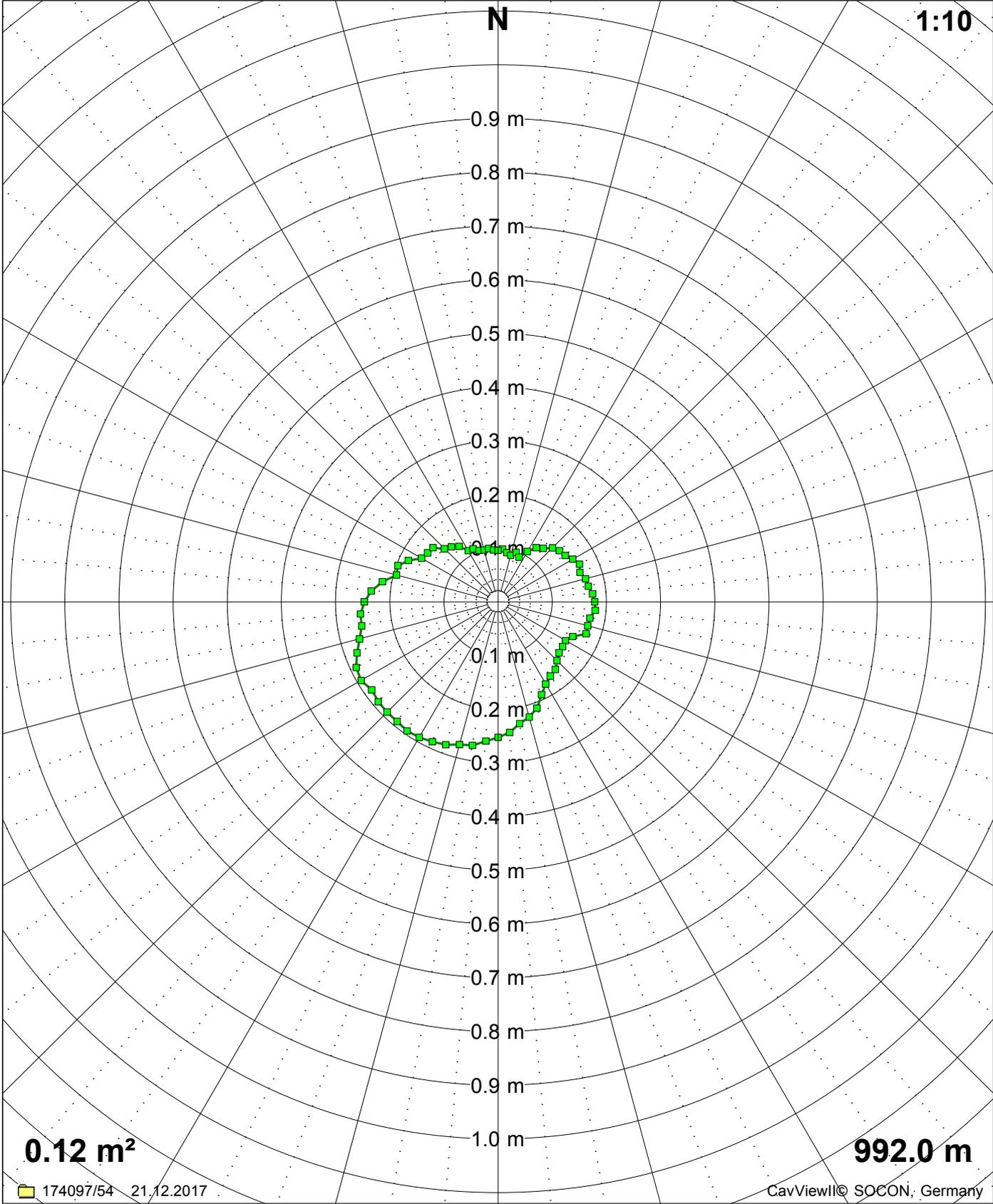
Heiligerlee K **21.12.2017**



 (21.12.2017) (0.12 m²)

d_{max} : 0.42 m 55° <--> 235° r_{min} : 0.11 m -> 16° r_{\sim} : 0.19 m r_{max} : 0.29 m -> 235°

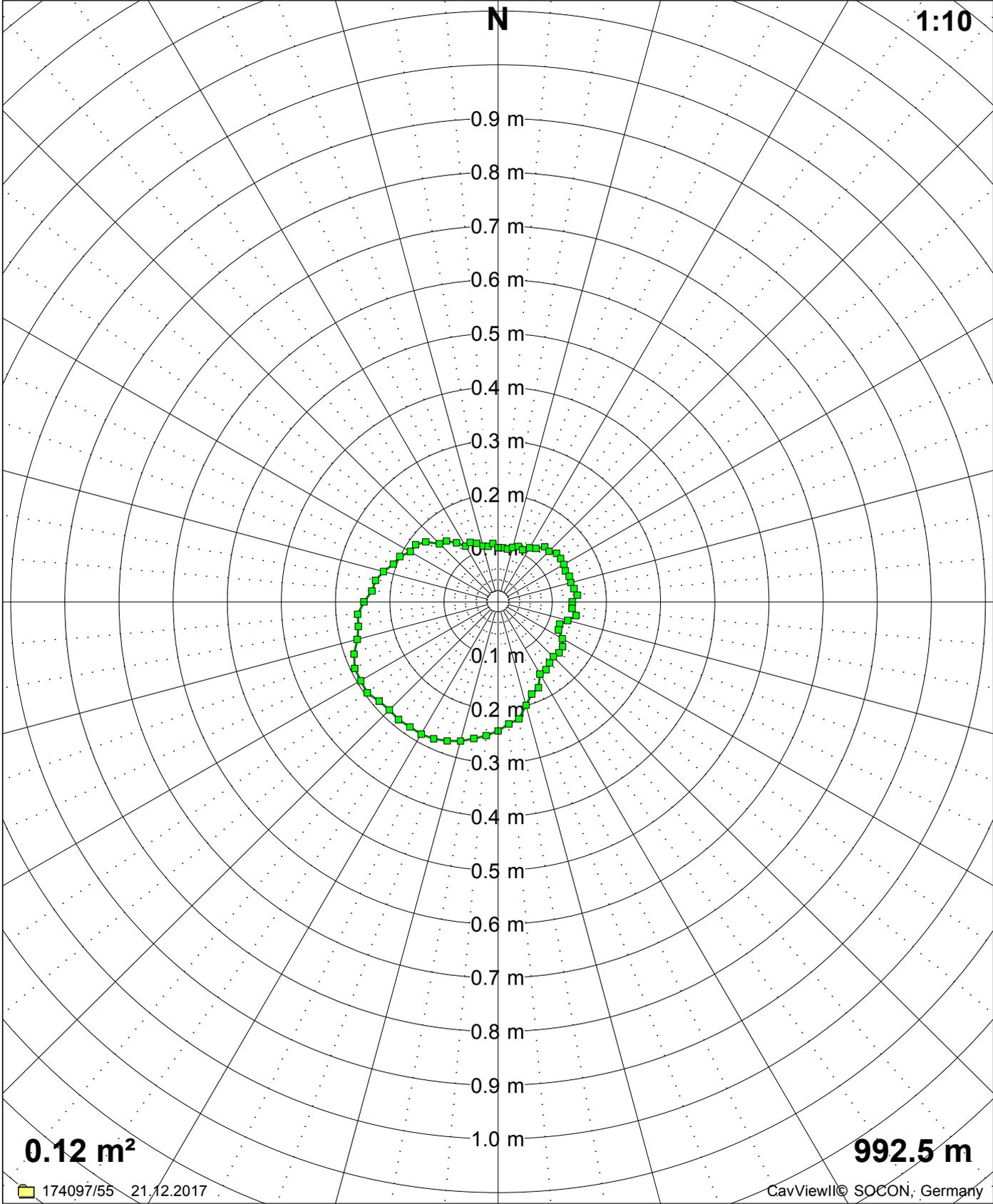
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.12 m²)

d_{max} : 0.45 m 65° <--> 245° r_{min} : 0.09 m -> 10° r_{\sim} : 0.20 m r_{max} : 0.29 m -> 215°

Heiligerlee K **21.12.2017**

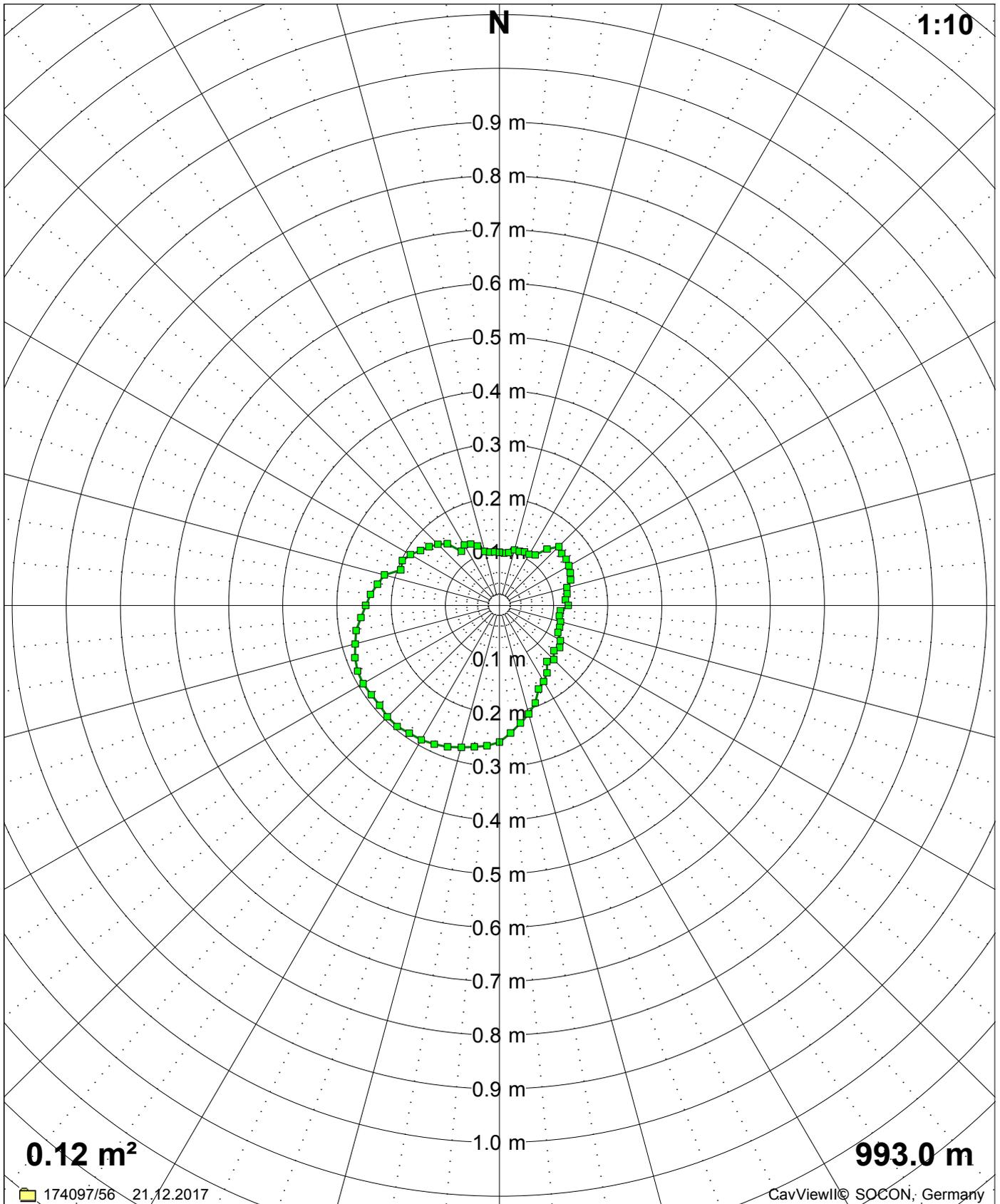


—■— (21.12.2017) (0.12 m²)

d_{\max} : 0.44 m $55^\circ \leftrightarrow 235^\circ$ r_{\min} : 0.10 m $\rightarrow 5^\circ$ r_{\sim} : 0.19 m r_{\max} : 0.29 m $\rightarrow 235^\circ$

Heiligerlee K

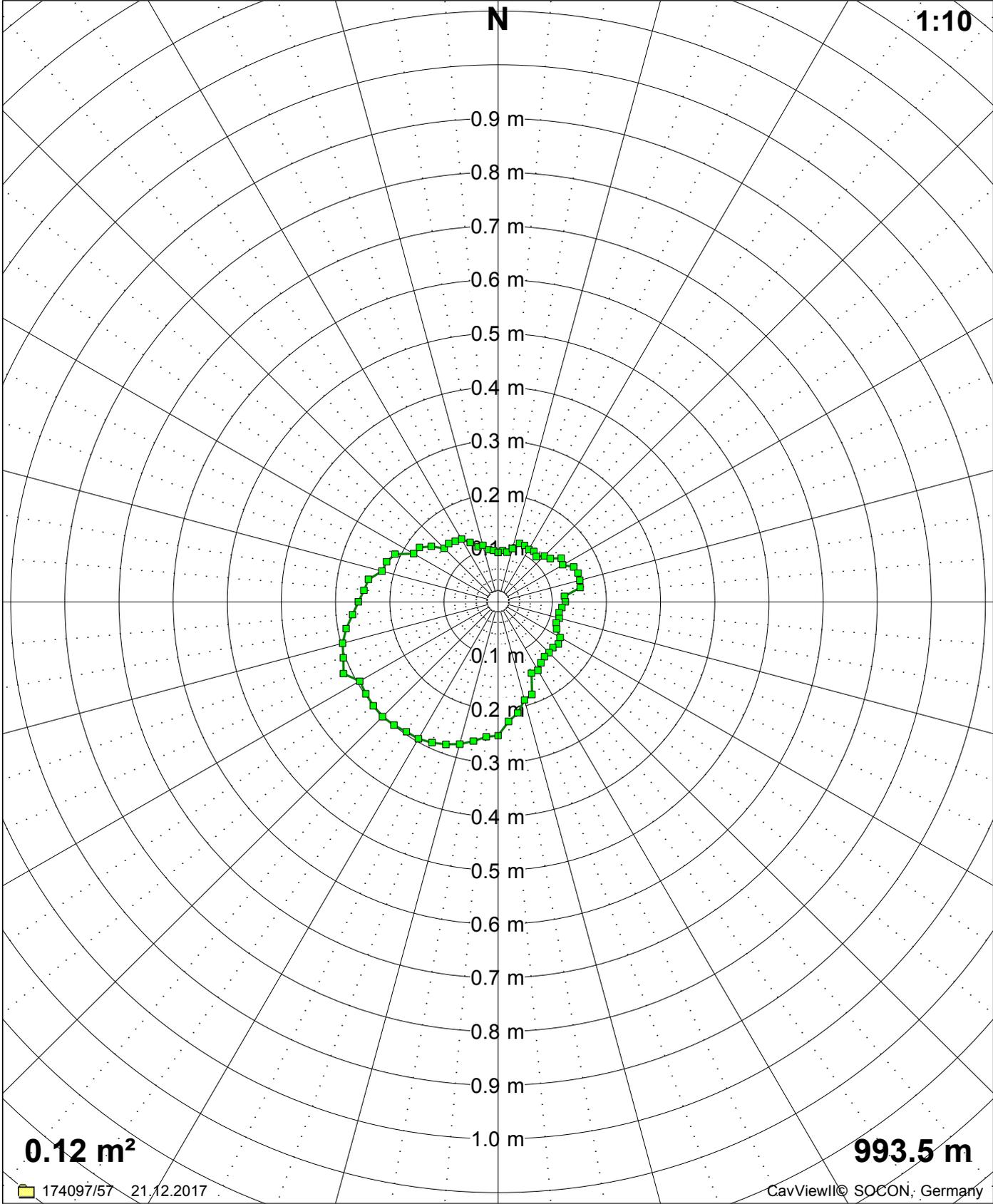
21.12.2017



—■— (21.12.2017) (0.12 m²)

d_{max} : 0.45 m 45° <--> 225° r_{min} : 0.10 m -> 0° r_{\sim} : 0.19 m r_{max} : 0.29 m -> 220°

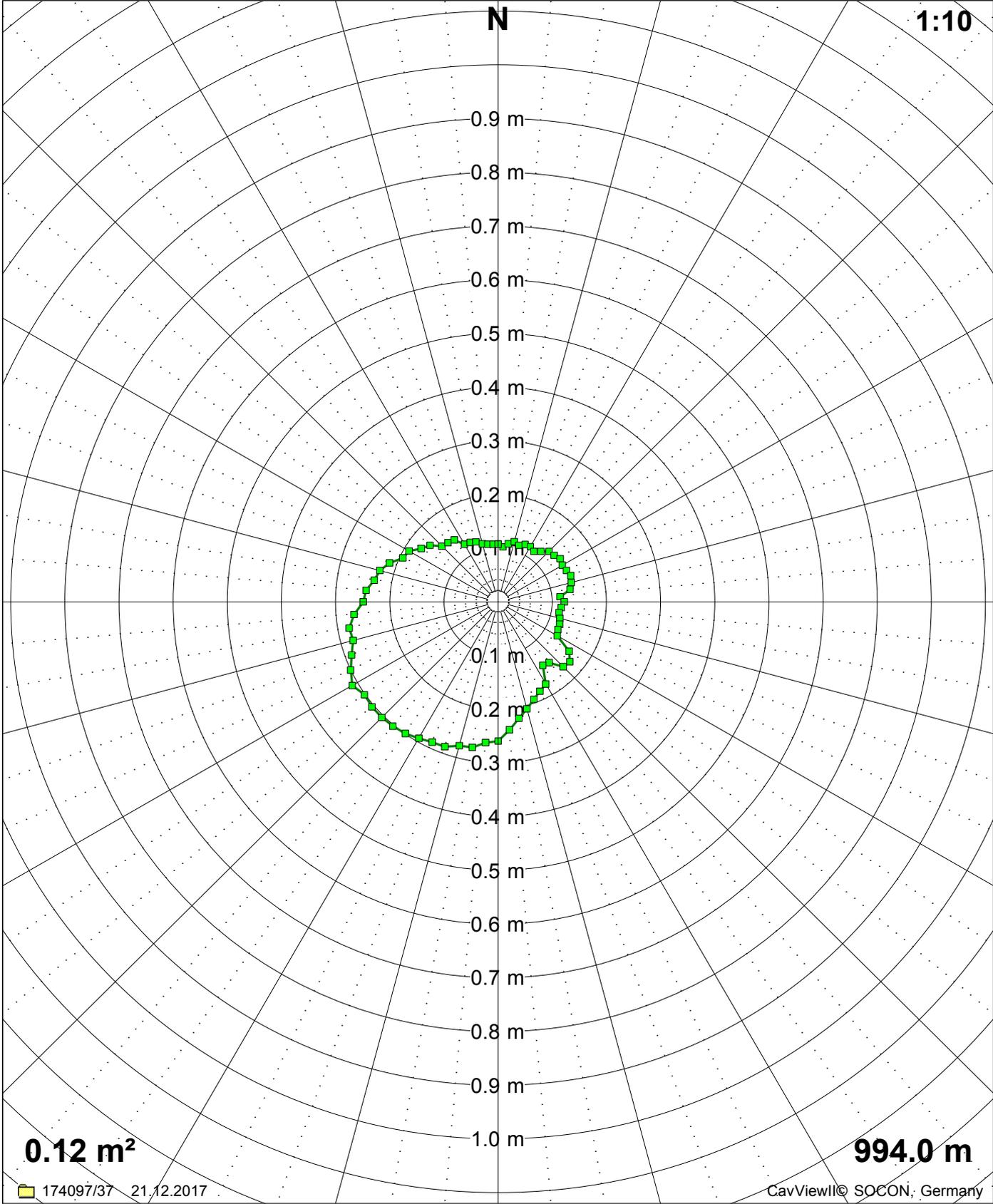
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.12 m²)

d_{max} : 0.47 m 65° ↔ 245° r_{min} : 0.09 m → 355° r_{\sim} : 0.19 m r_{max} : 0.32 m → 245°

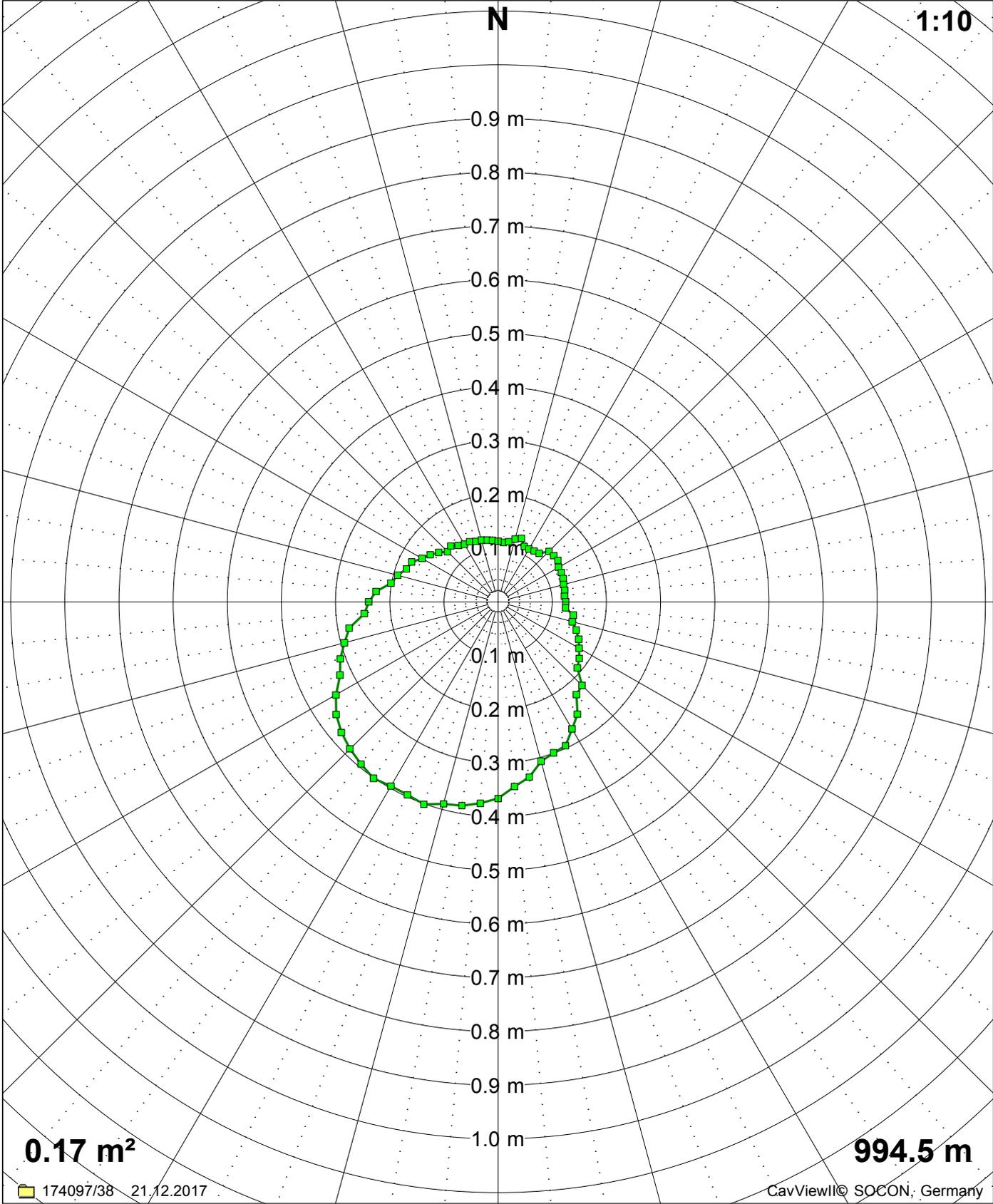
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.12 m²)

d_{max} : 0.45 m 60° <--> 240° r_{min} : 0.10 m -> 0° r_{\sim} : 0.20 m r_{max} : 0.31 m -> 240°

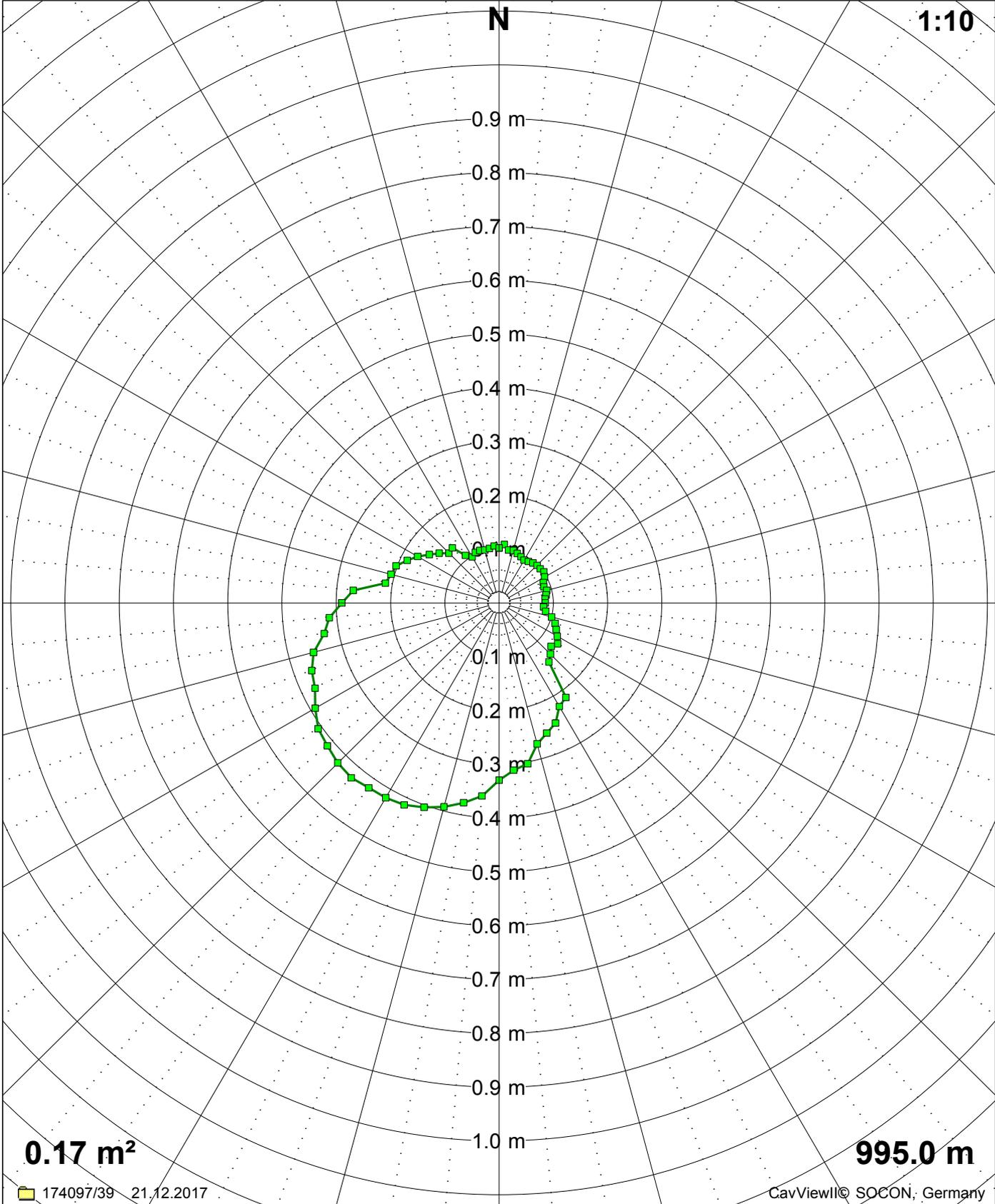
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.17 m²)

d_{max} : 0.53 m 20° <--> 200° r_{min} : 0.11 m -> 0° r_{\sim} : 0.24 m r_{max} : 0.40 m -> 200°

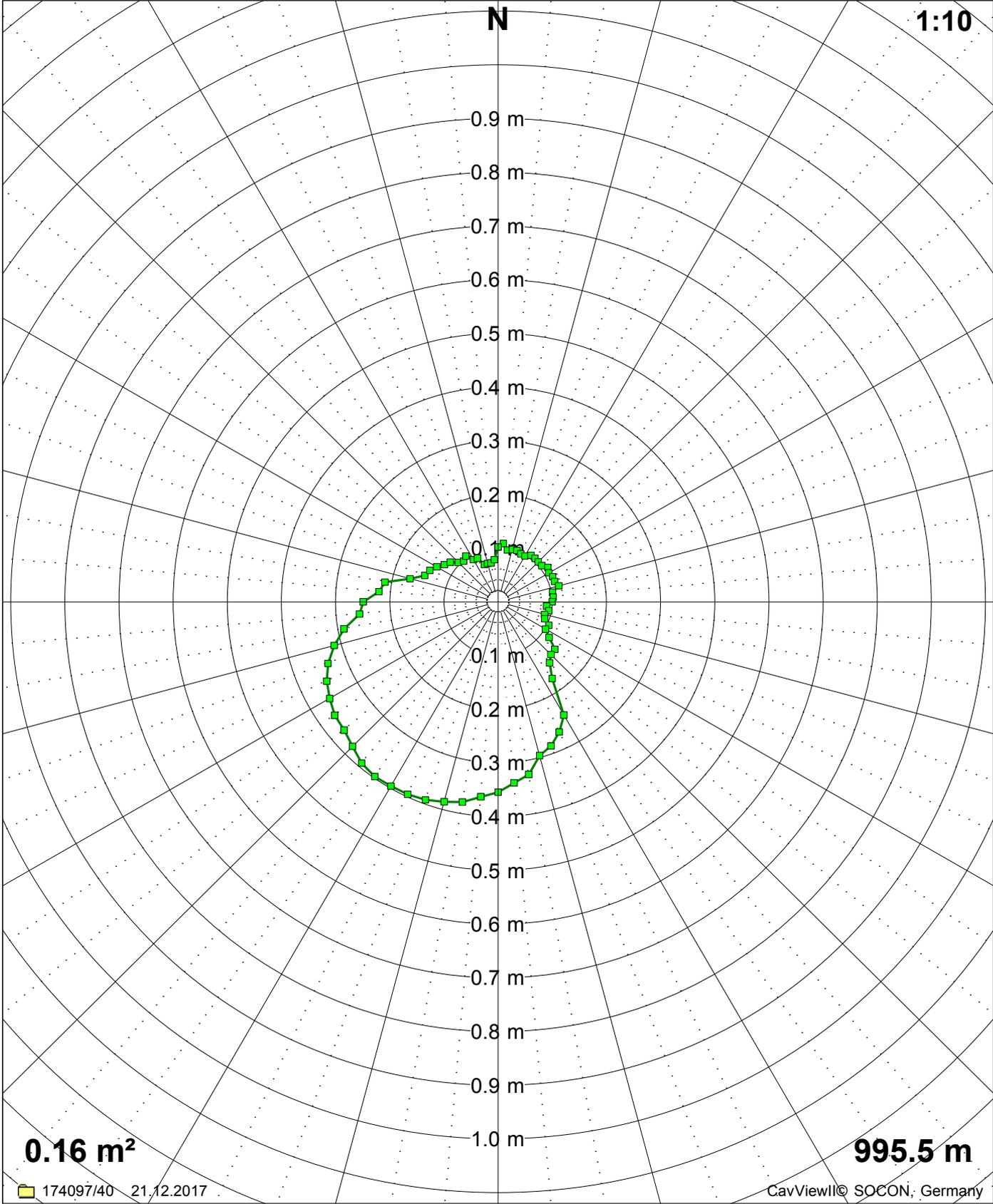
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.17 m²)

d_{max} : 0.52 m 40° <--> 220° r_{min} : 0.08 m -> 90° r_{\sim} : 0.23 m r_{max} : 0.42 m -> 220°

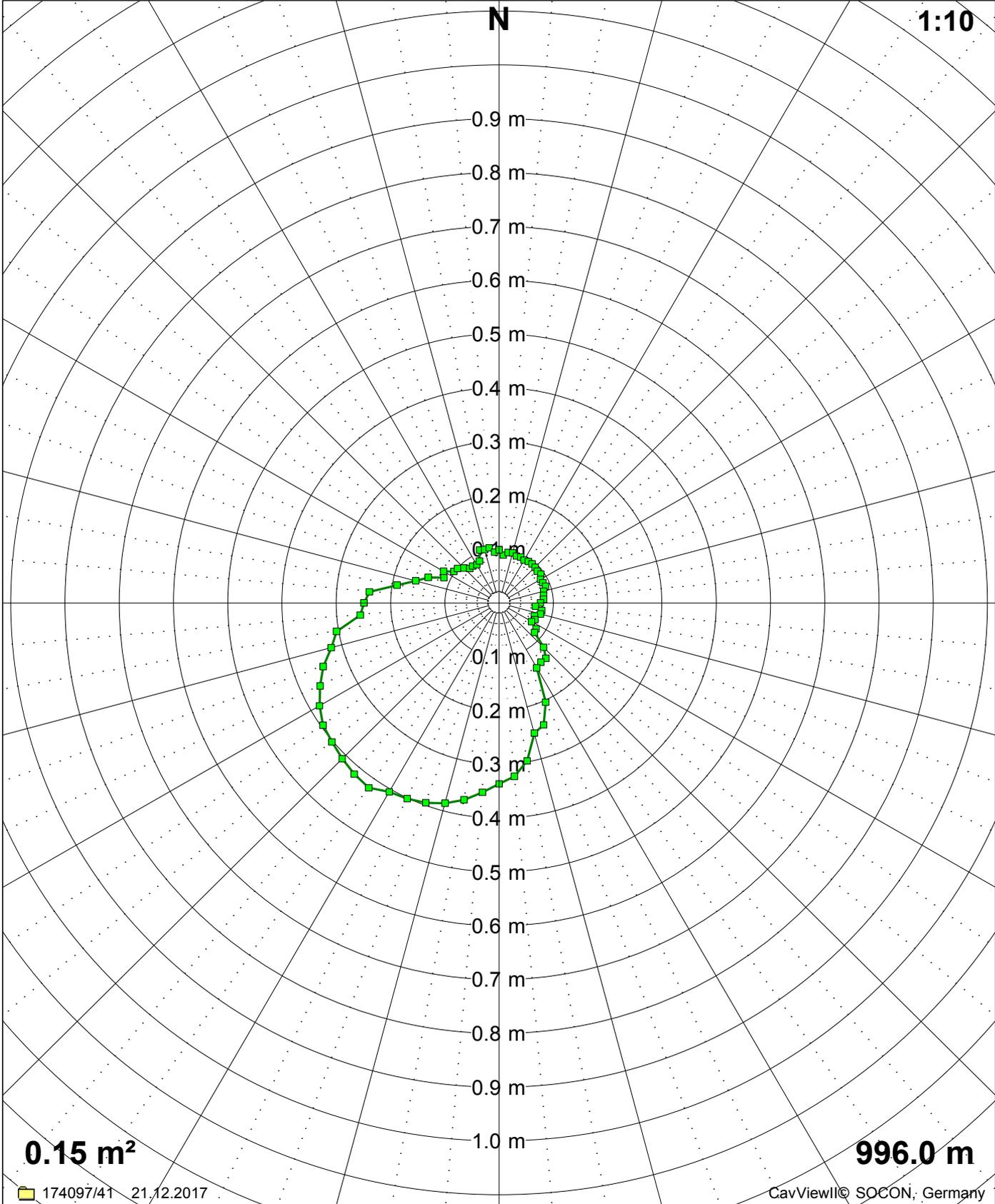
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.16 m²)

d_{max} : 0.50 m 35° <--> 215° r_{min} : 0.07 m -> 336° r_{\sim} : 0.22 m r_{max} : 0.40 m -> 215°

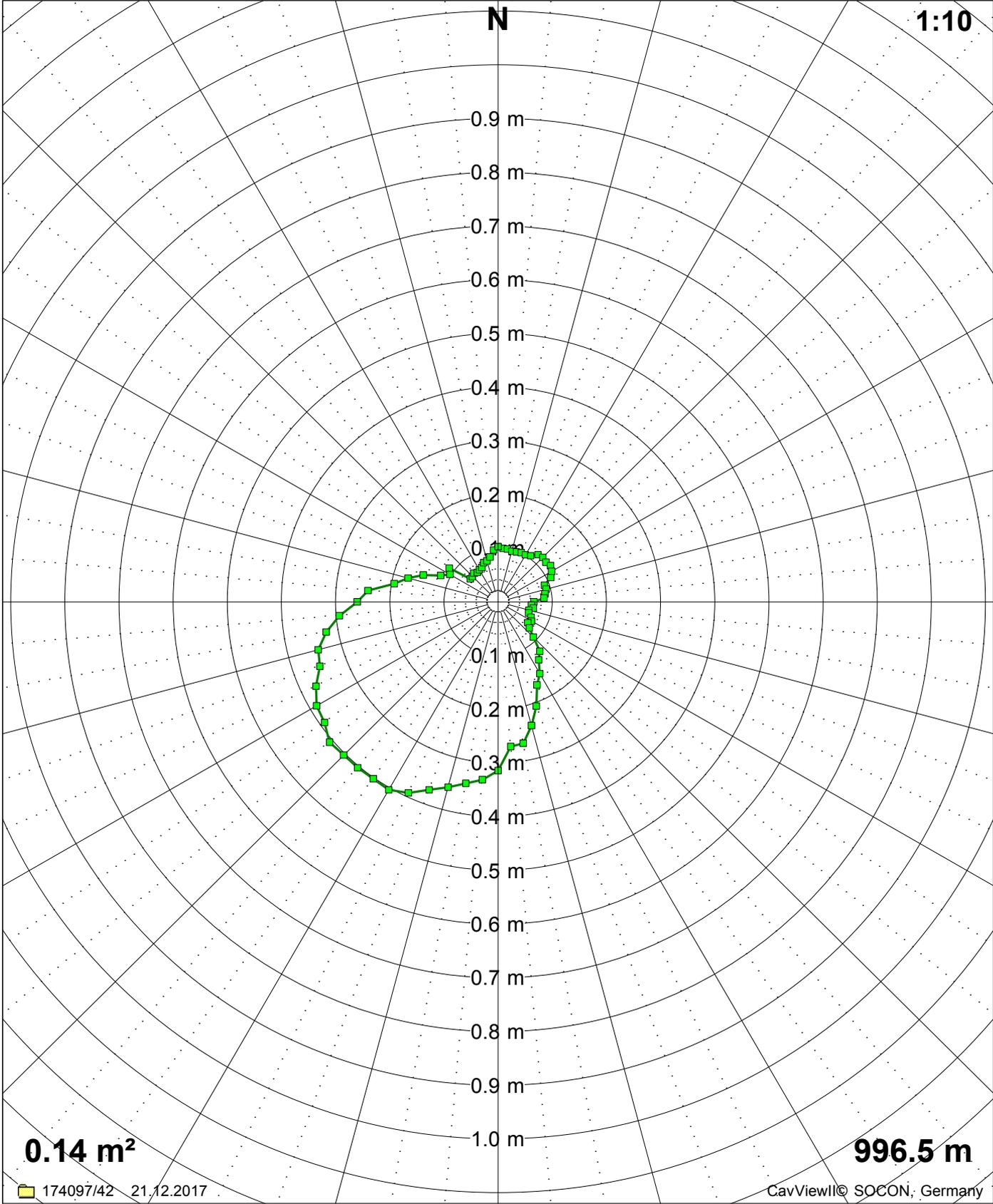
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.15 m²)

d_{max} : 0.51 m 35° <--> 215° r_{min} : 0.07 m -> 91° r_{\sim} : 0.22 m r_{max} : 0.42 m -> 215°

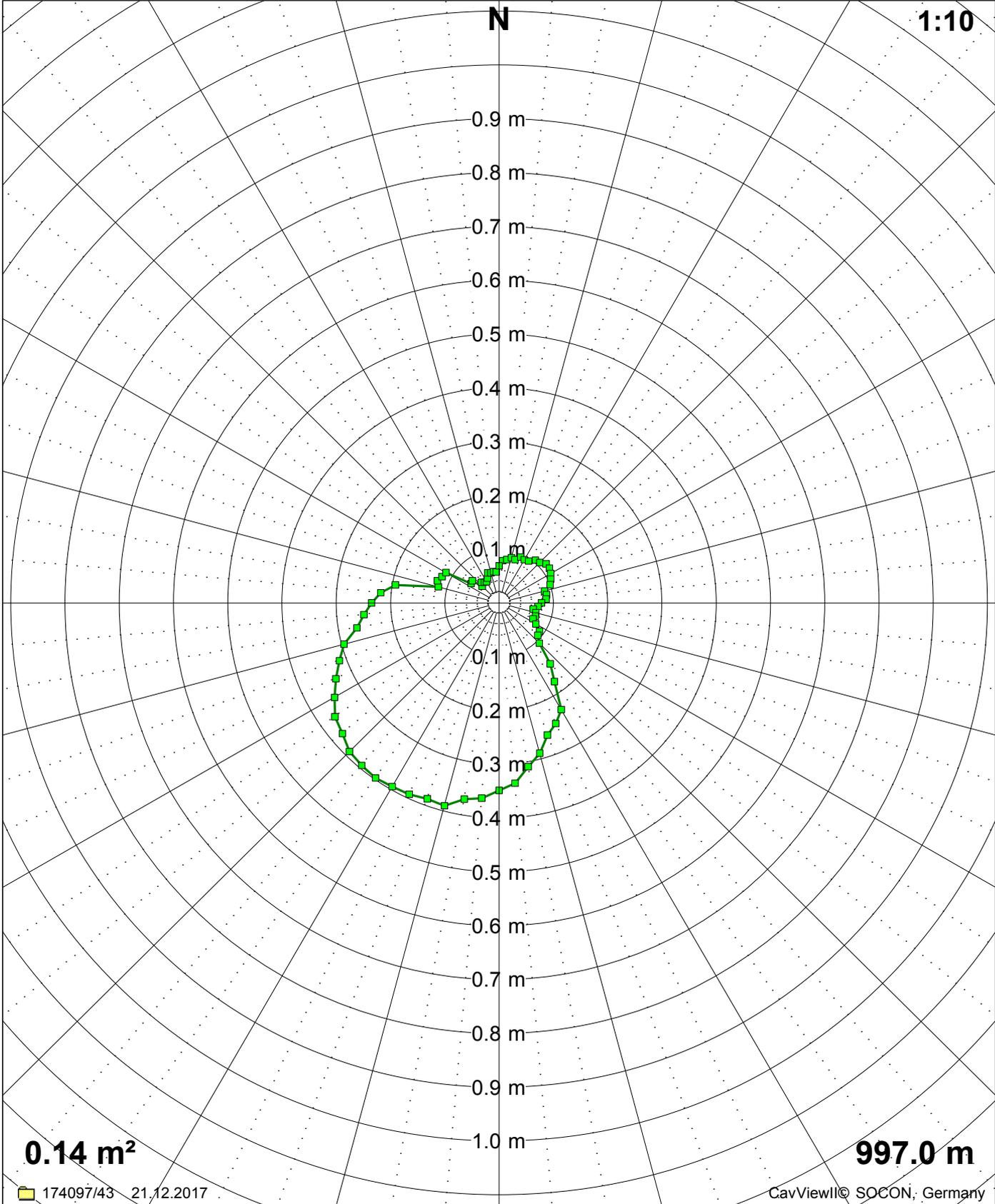
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.14 m²)

d_{max} : 0.52 m 50° ↔ 230° r_{min} : 0.06 m → 100° r_{\sim} : 0.21 m r_{max} : 0.41 m → 230°

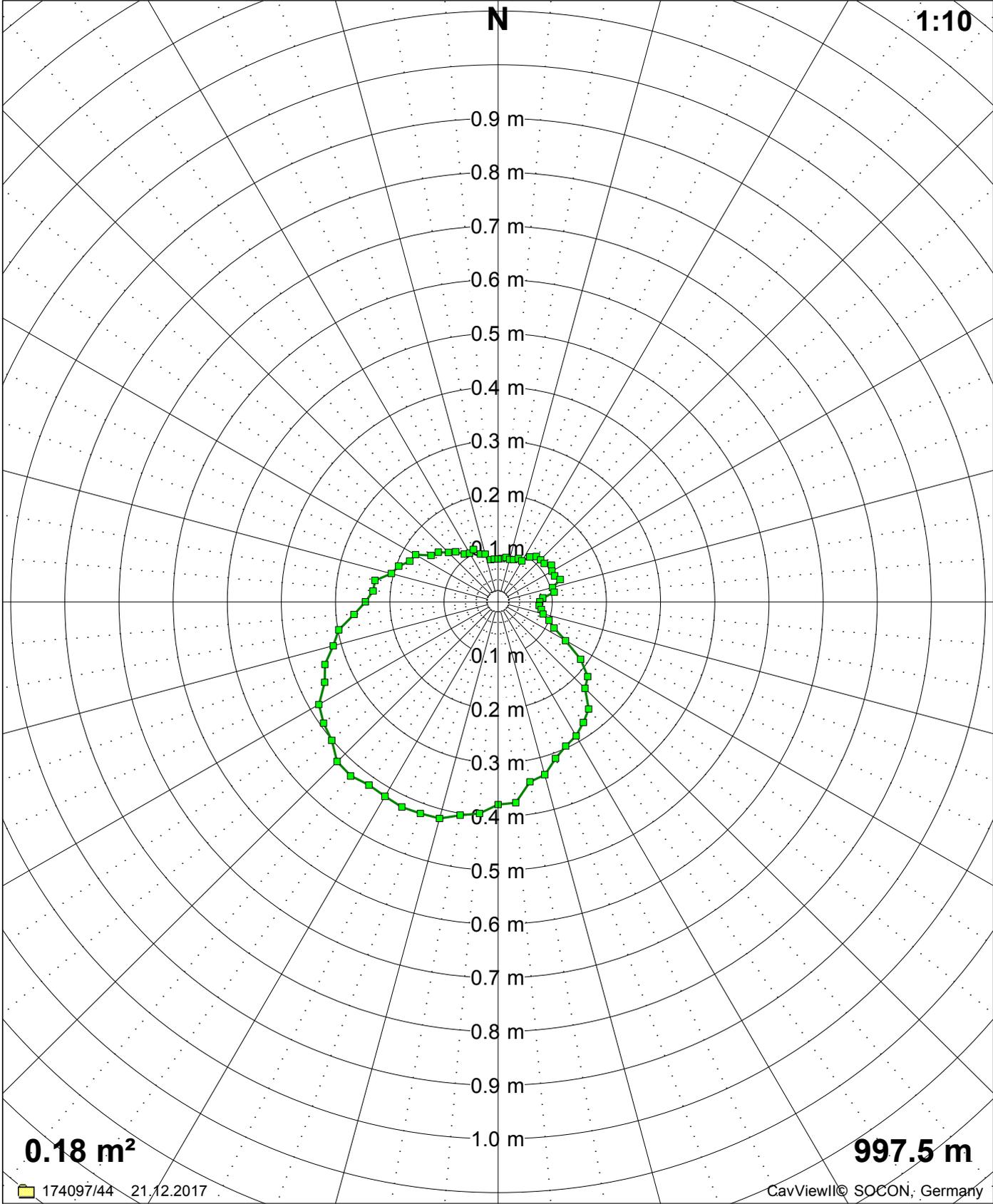
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.14 m²)

d_{max} : 0.50 m 40° <--> 220° r_{min} : 0.04 m -> 312° r_{\sim} : 0.21 m r_{max} : 0.40 m -> 215°

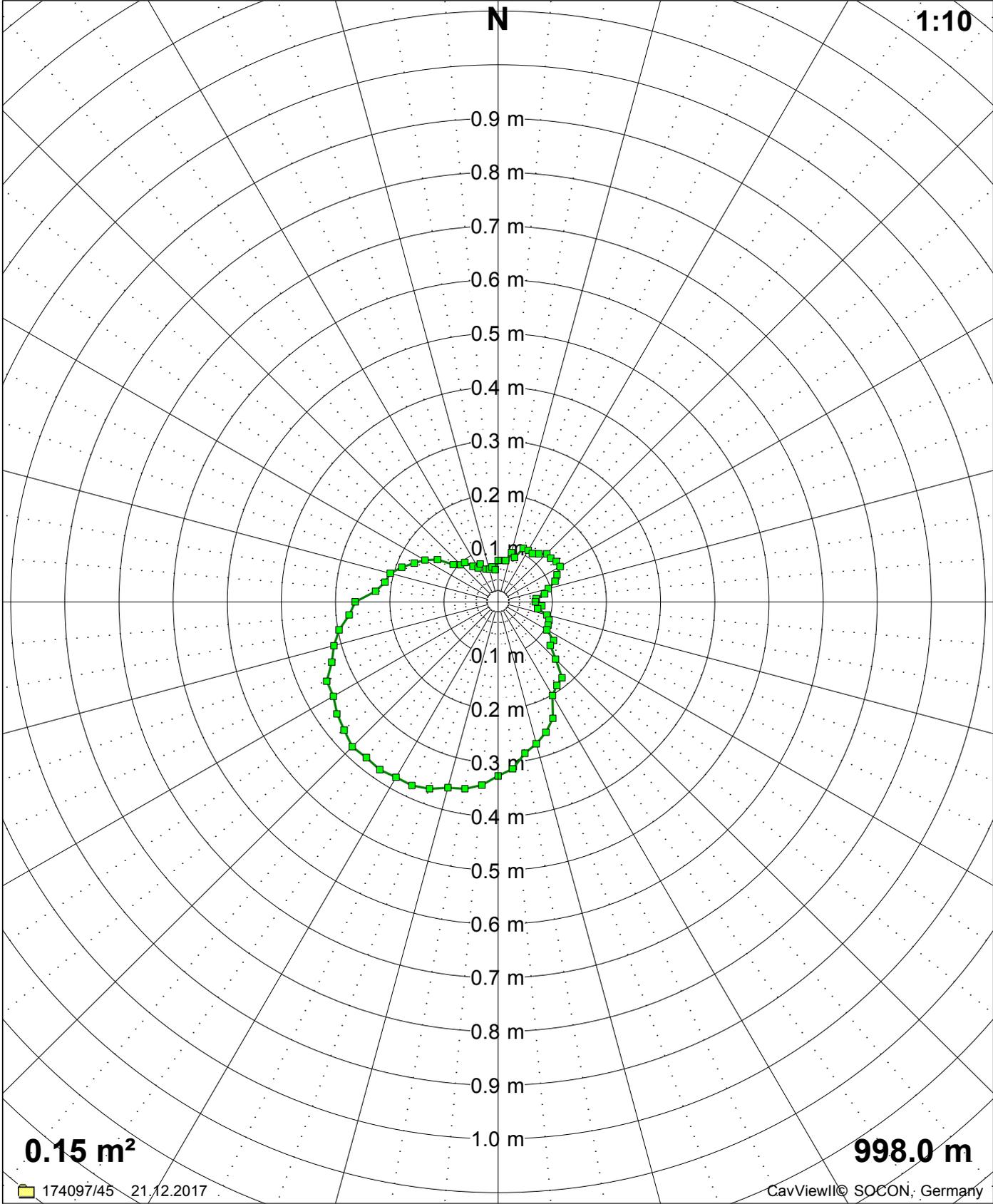
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.18 m²)

d_{max} : 0.53 m 40° <--> 220° r_{min} : 0.07 m -> 90° r_{\sim} : 0.24 m r_{max} : 0.42 m -> 220°

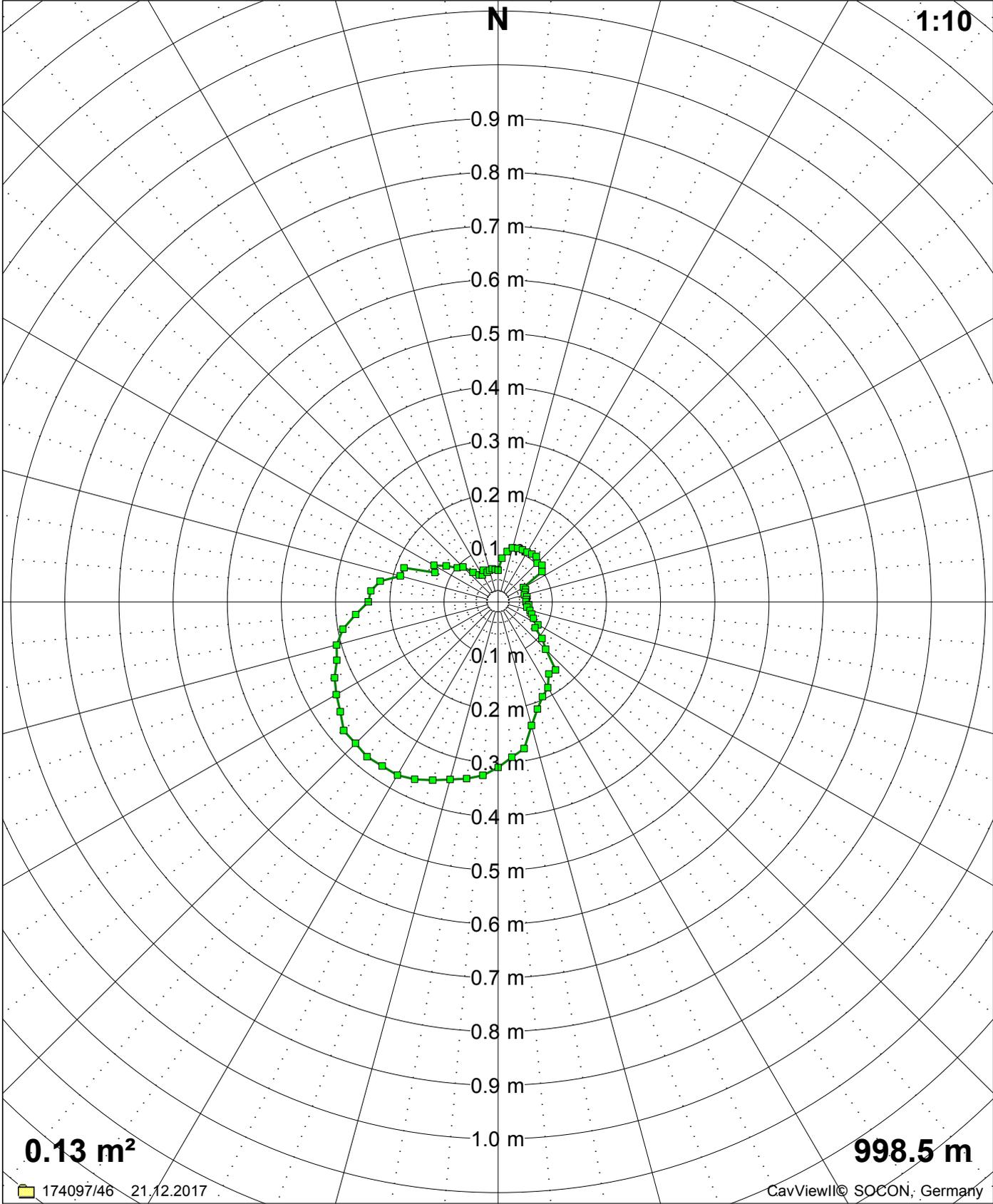
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.15 m²)

d_{max} : 0.51 m 45° <--> 225° r_{min} : 0.06 m -> 350° r_{\sim} : 0.22 m r_{max} : 0.38 m -> 215°

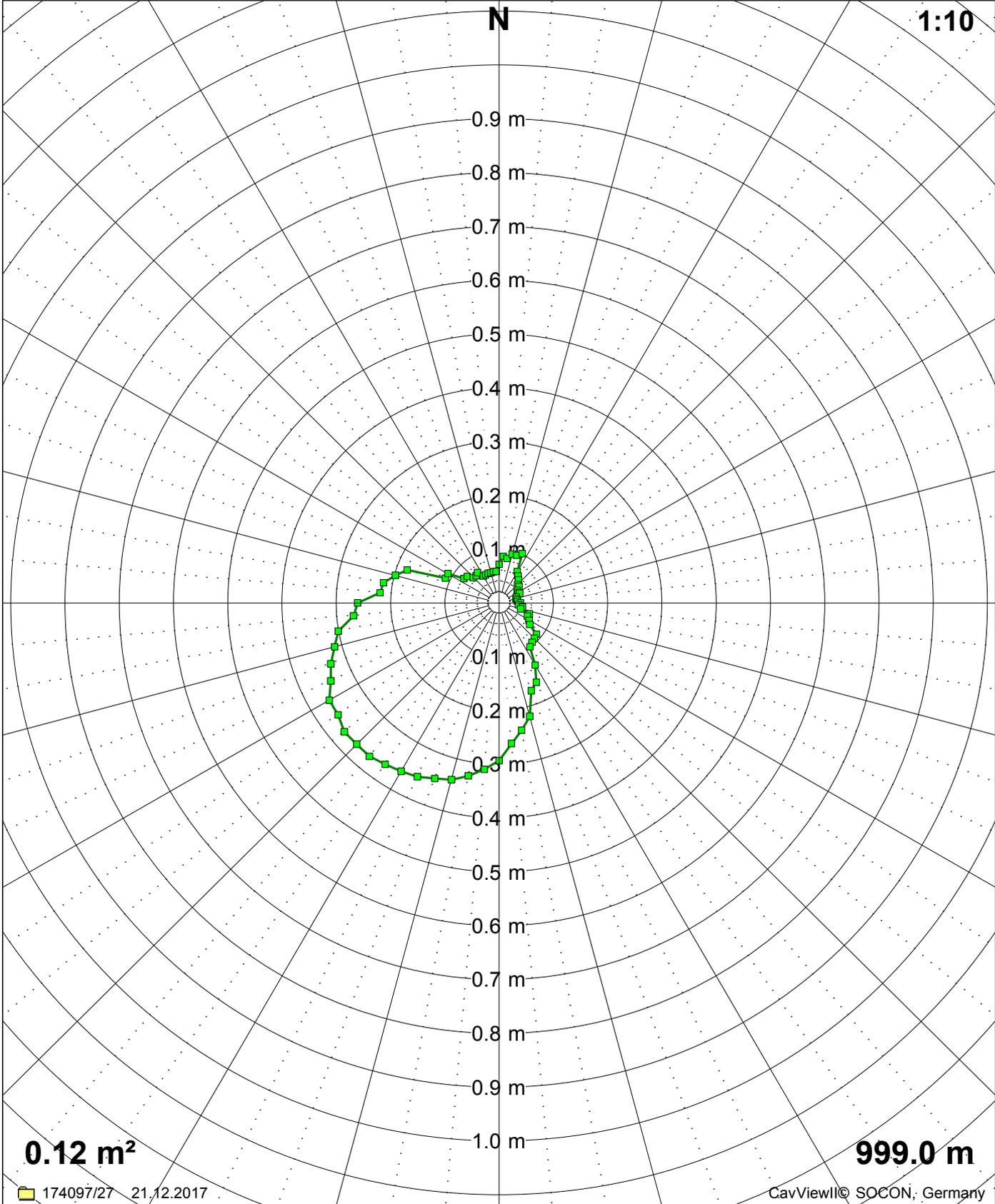
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.13 m²)

d_{max} : 0.49 m 40° <--> 220° r_{min} : 0.05 m -> 70° r_{\sim} : 0.20 m r_{max} : 0.38 m -> 220°

Heiligerlee K **21.12.2017**

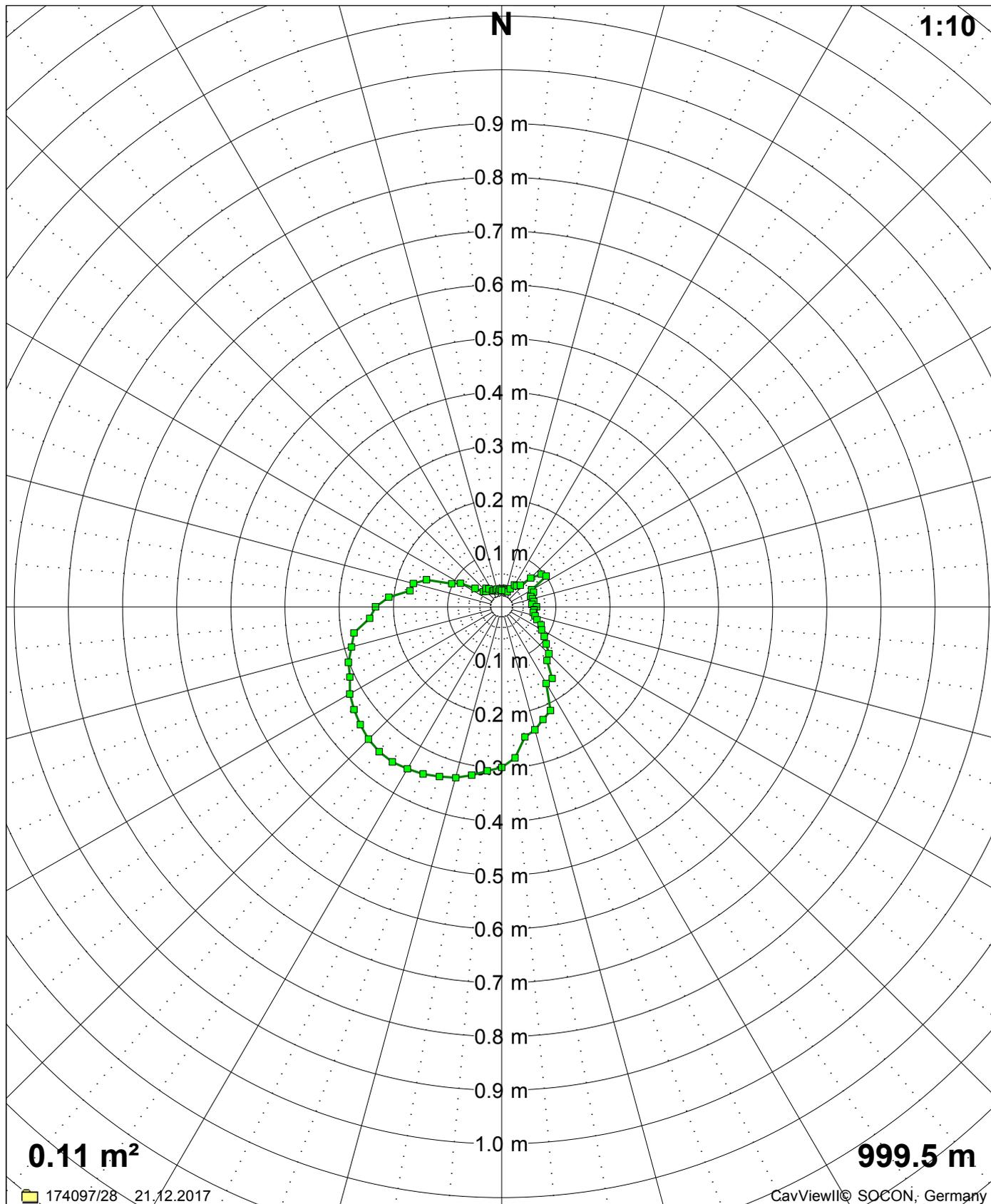


—■— (21.12.2017) (0.12 m²)

d_{max} : 0.46 m 25° <--> 205° r_{min} : 0.03 m -> 70° r_{\sim} : 0.20 m r_{max} : 0.37 m -> 220°

Heiligerlee K

21.12.2017

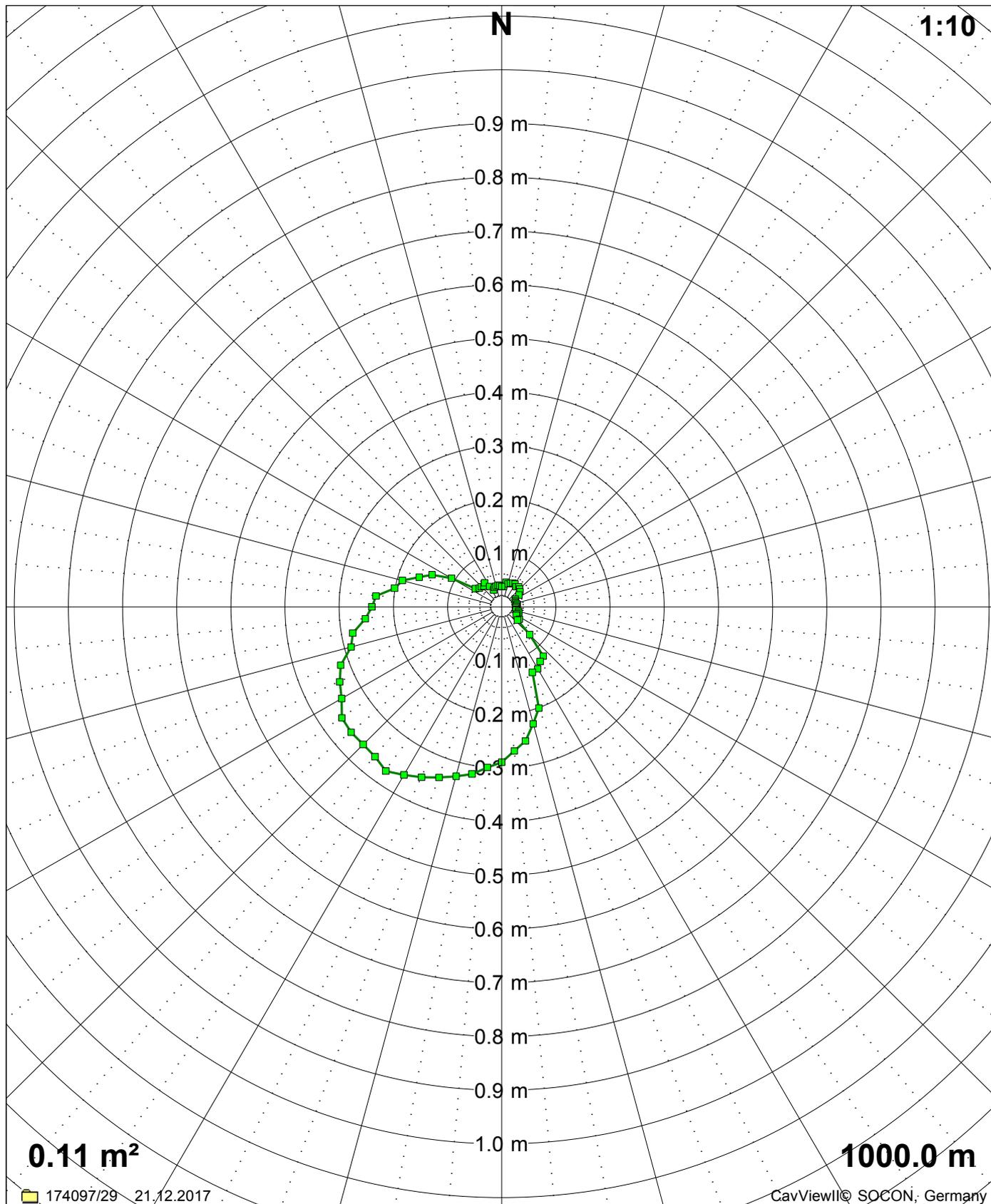


—■— (21.12.2017) (0.11 m²)

d_{max} : 0.44 m 50° <--> 230° r_{min} : 0.03 m -> 15° r_{\sim} : 0.19 m r_{max} : 0.35 m -> 215°

Heiligerlee K

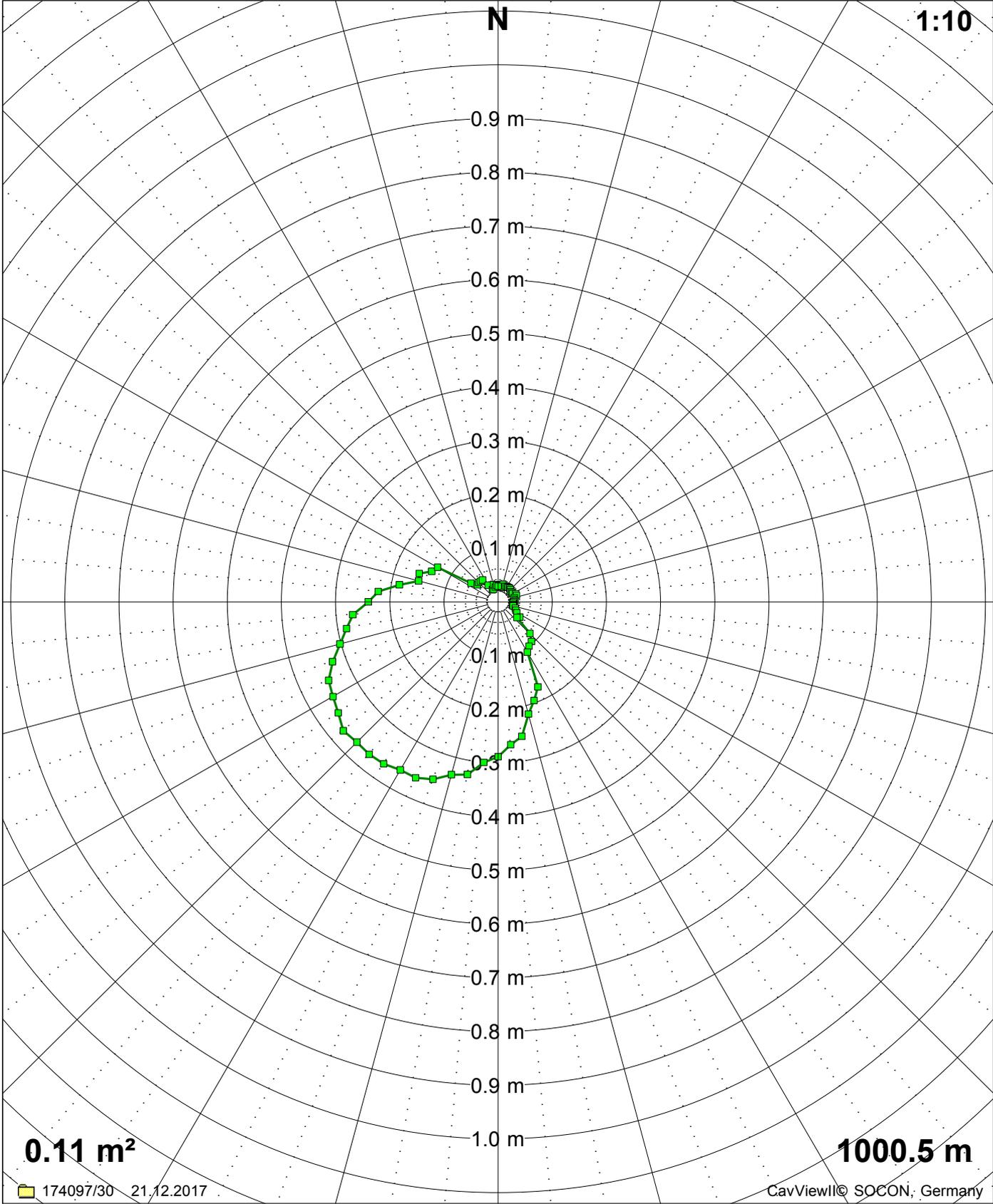
21.12.2017



—■— (21.12.2017) (0.11 m²)

d_{max} : 0.42 m 35° <--> 215° r_{min} : 0.03 m -> 65° r_{\sim} : 0.19 m r_{max} : 0.37 m -> 215°

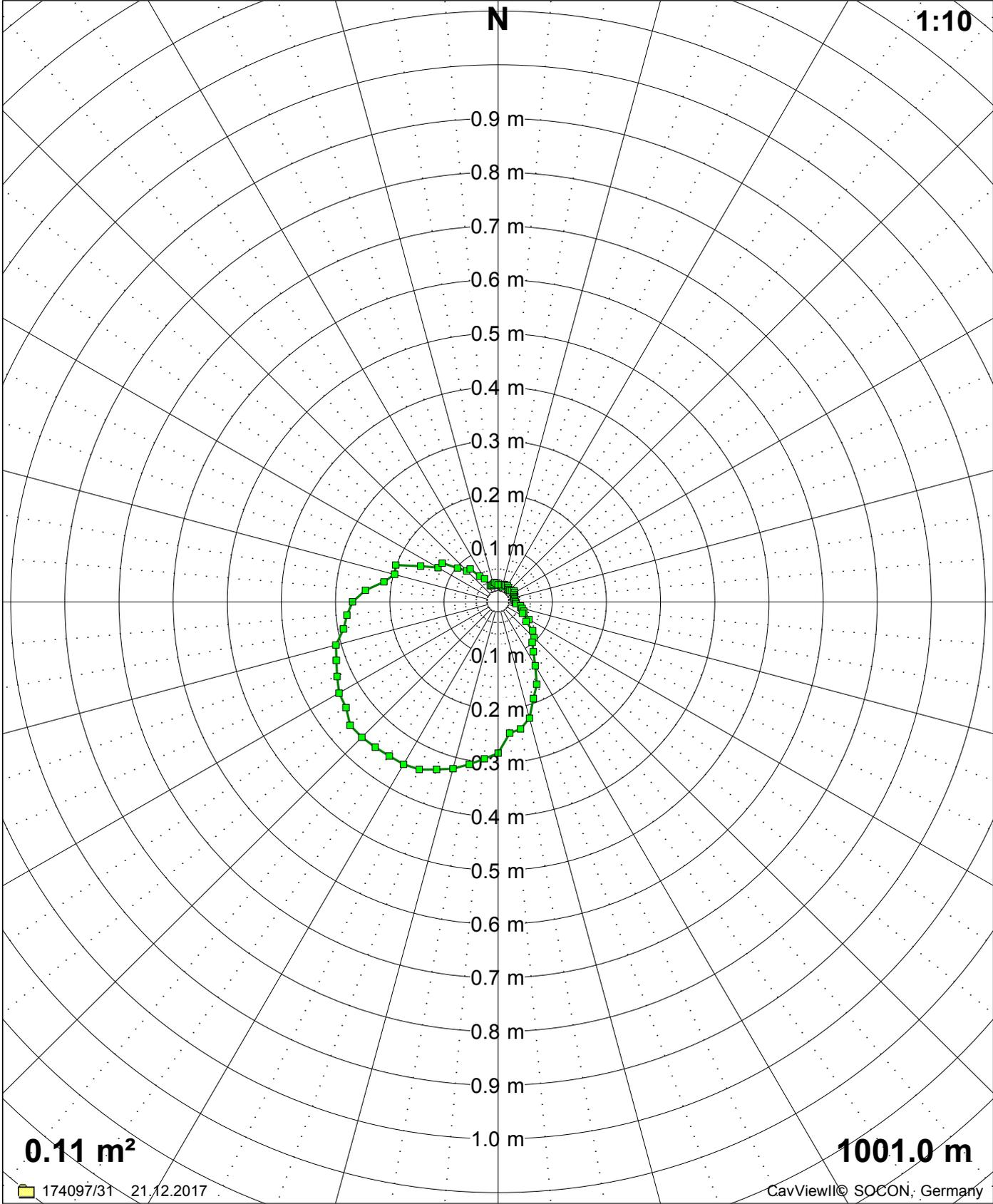
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.11 m²)

d_{max} : 0.40 m 40° <--> 220° r_{min} : 0.02 m -> 331° r_{\sim} : 0.19 m r_{max} : 0.37 m -> 230°

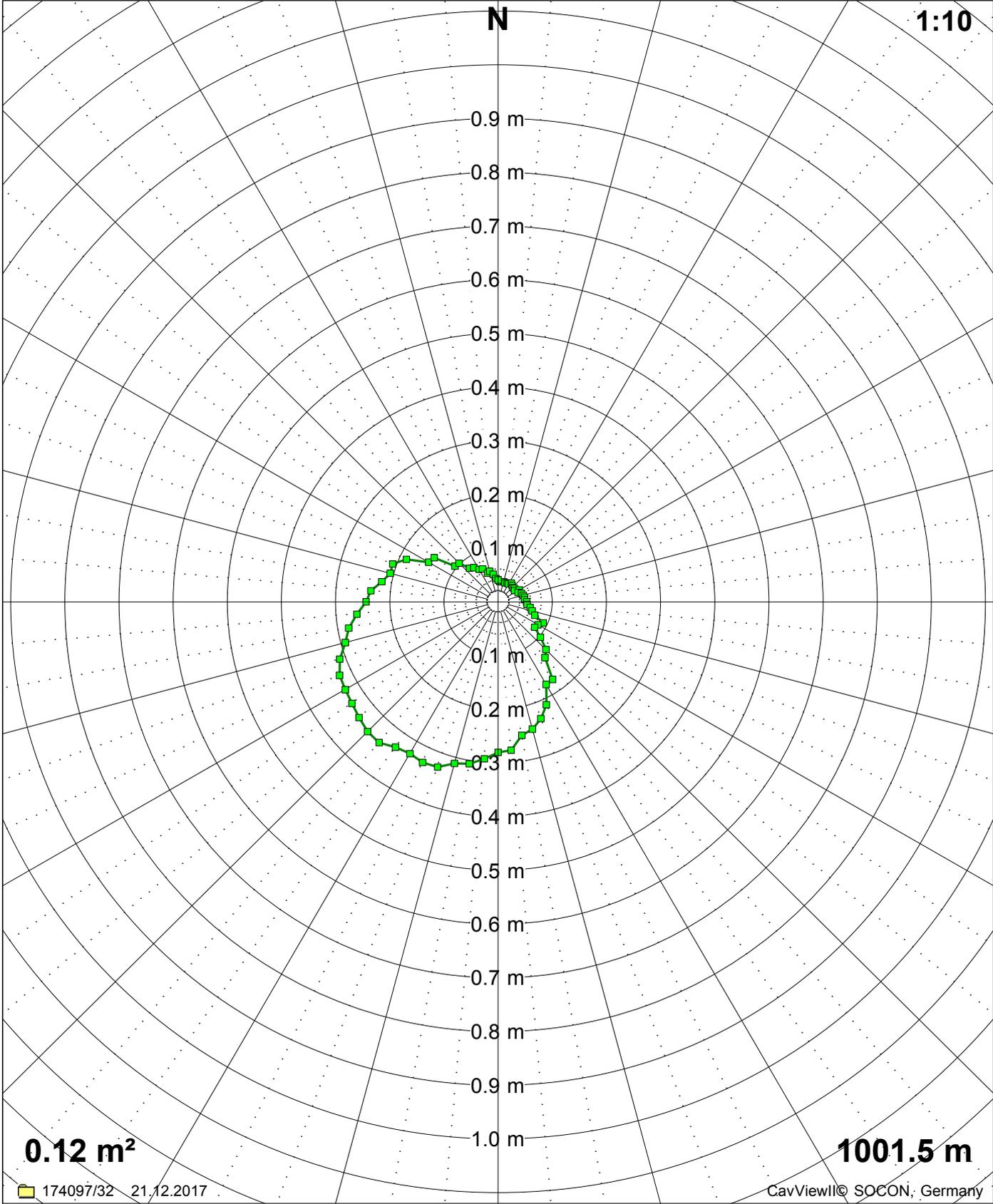
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.11 m²)

d_{max} : 0.39 m 50° <--> 230° r_{min} : 0.03 m -> 10° r_{\sim} : 0.19 m r_{max} : 0.36 m -> 230°

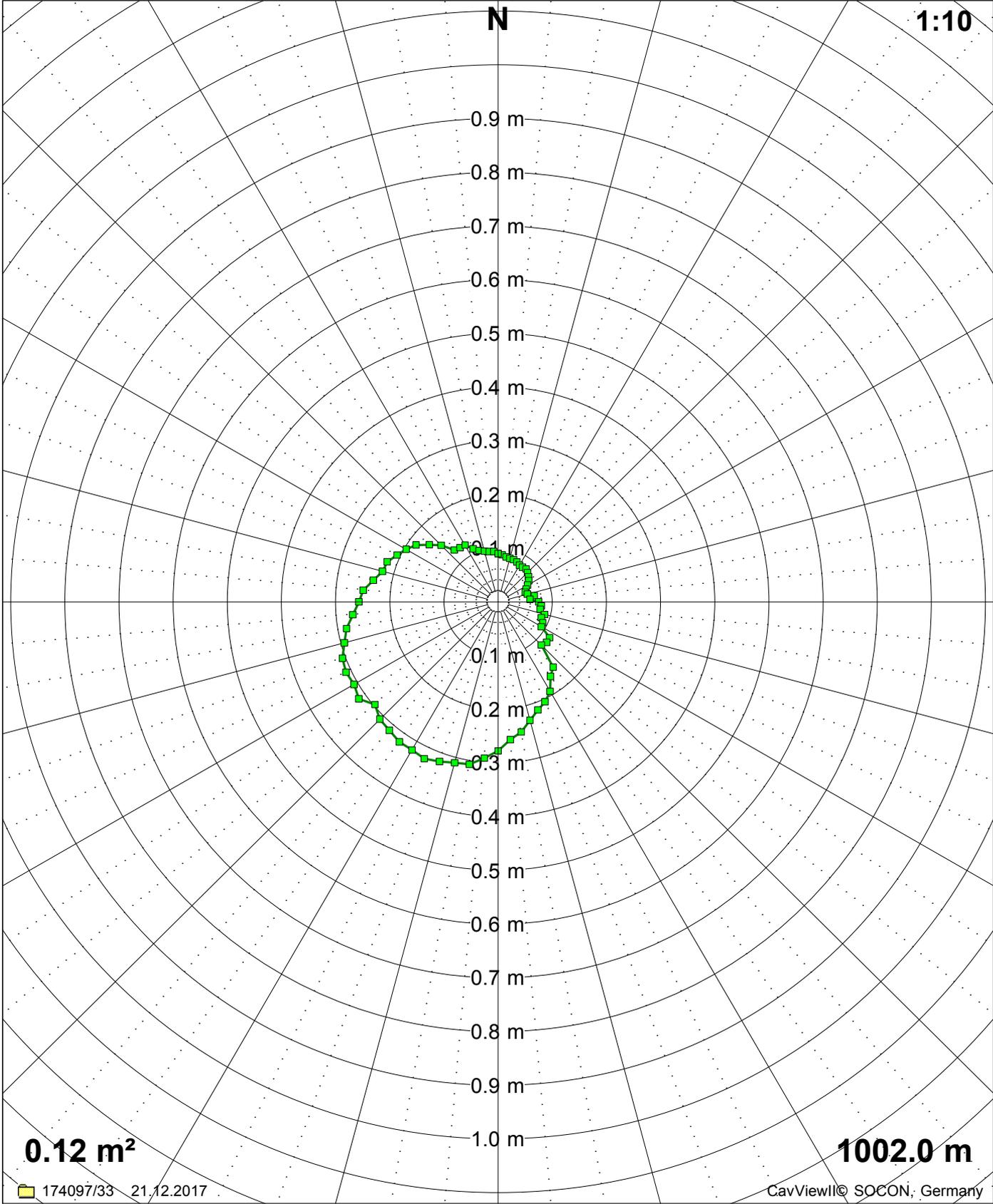
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.12 m²)

d_{\max} : 0.38 m 40° <--> 220° r_{\min} : 0.04 m -> 50° r_{\sim} : 0.19 m r_{\max} : 0.34 m -> 220°

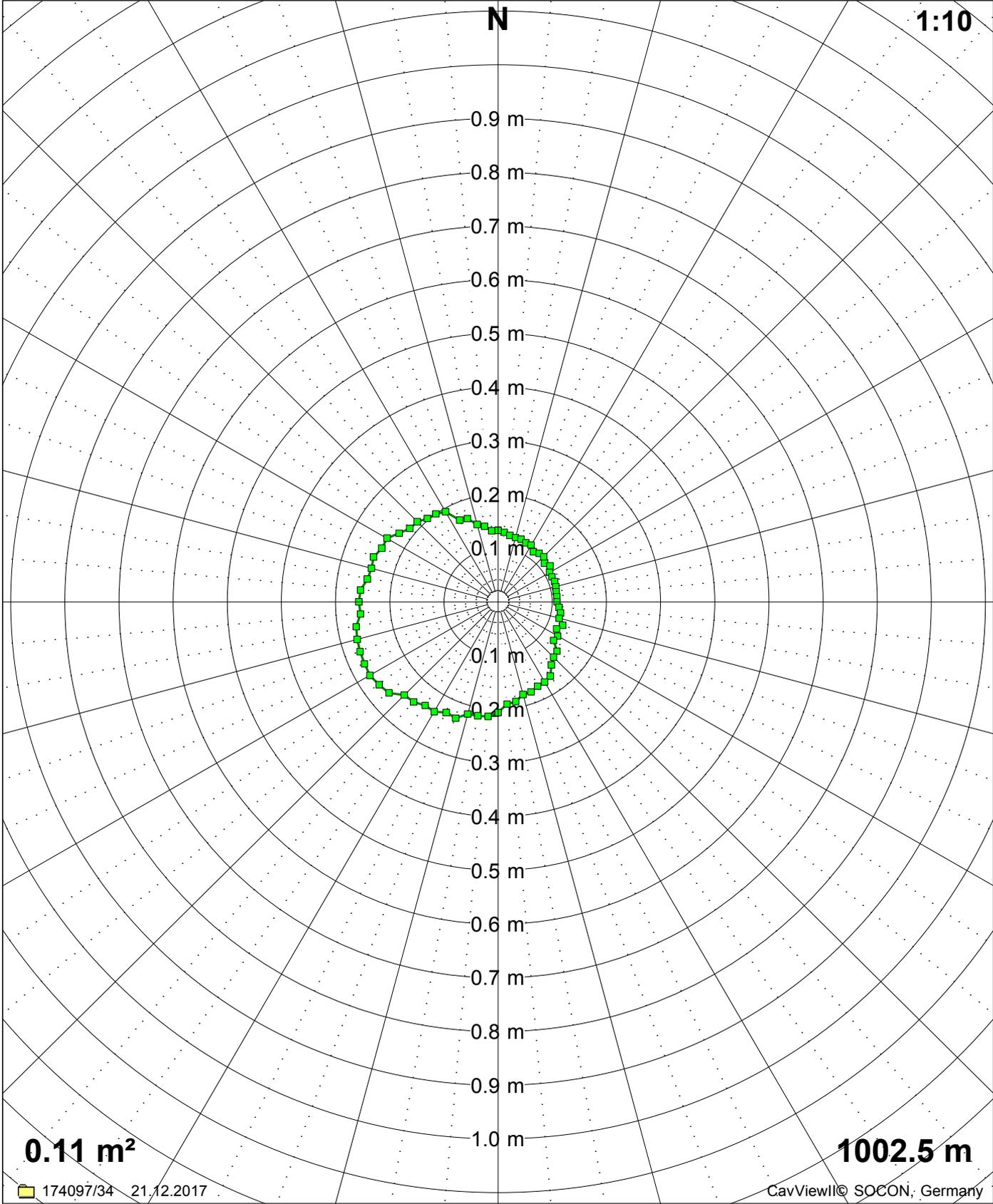
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.12 m²)

d_{max} : 0.40 m 25° <--> 205° r_{min} : 0.05 m -> 65° r_{\sim} : 0.20 m r_{max} : 0.32 m -> 205°

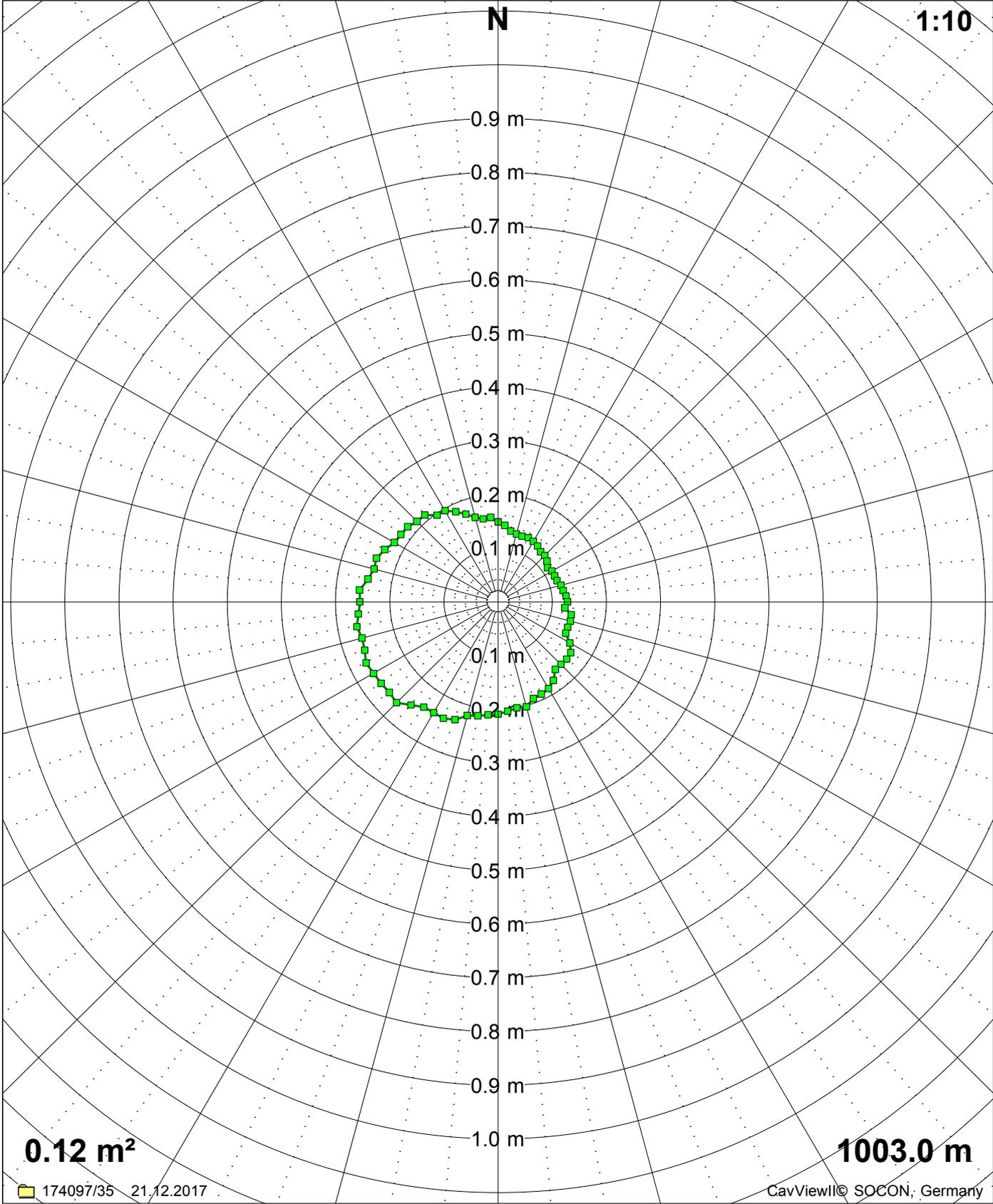
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.11 m²)

d_{max} : 0.39 m 55° <--> 235° r_{min} : 0.11 m -> 75° r_{\sim} : 0.19 m r_{max} : 0.27 m -> 240°

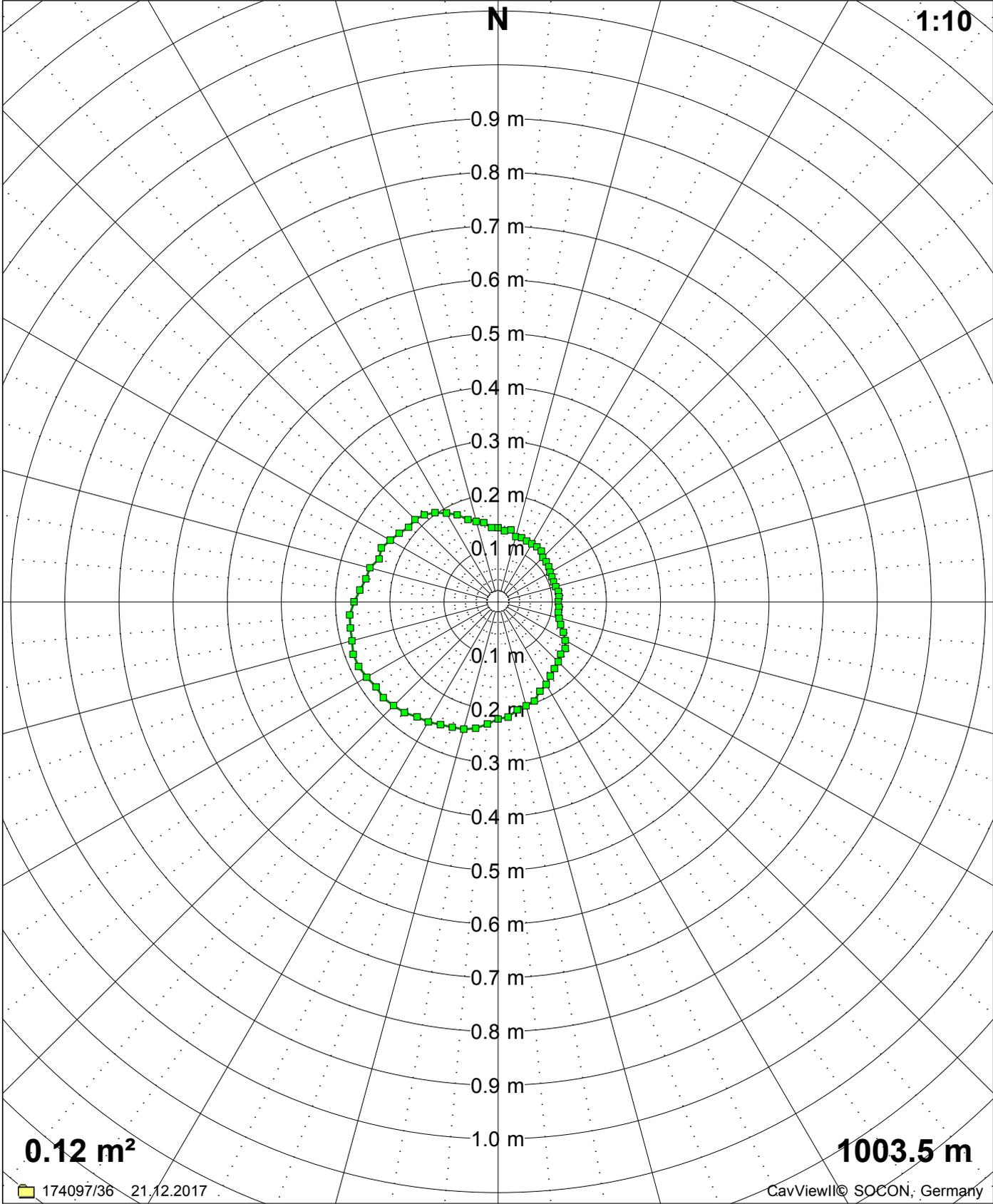
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.12 m²)

d_{max} : 0.39 m 45° <--> 225° r_{min} : 0.11 m -> 50° r_{\sim} : 0.19 m r_{max} : 0.27 m -> 245°

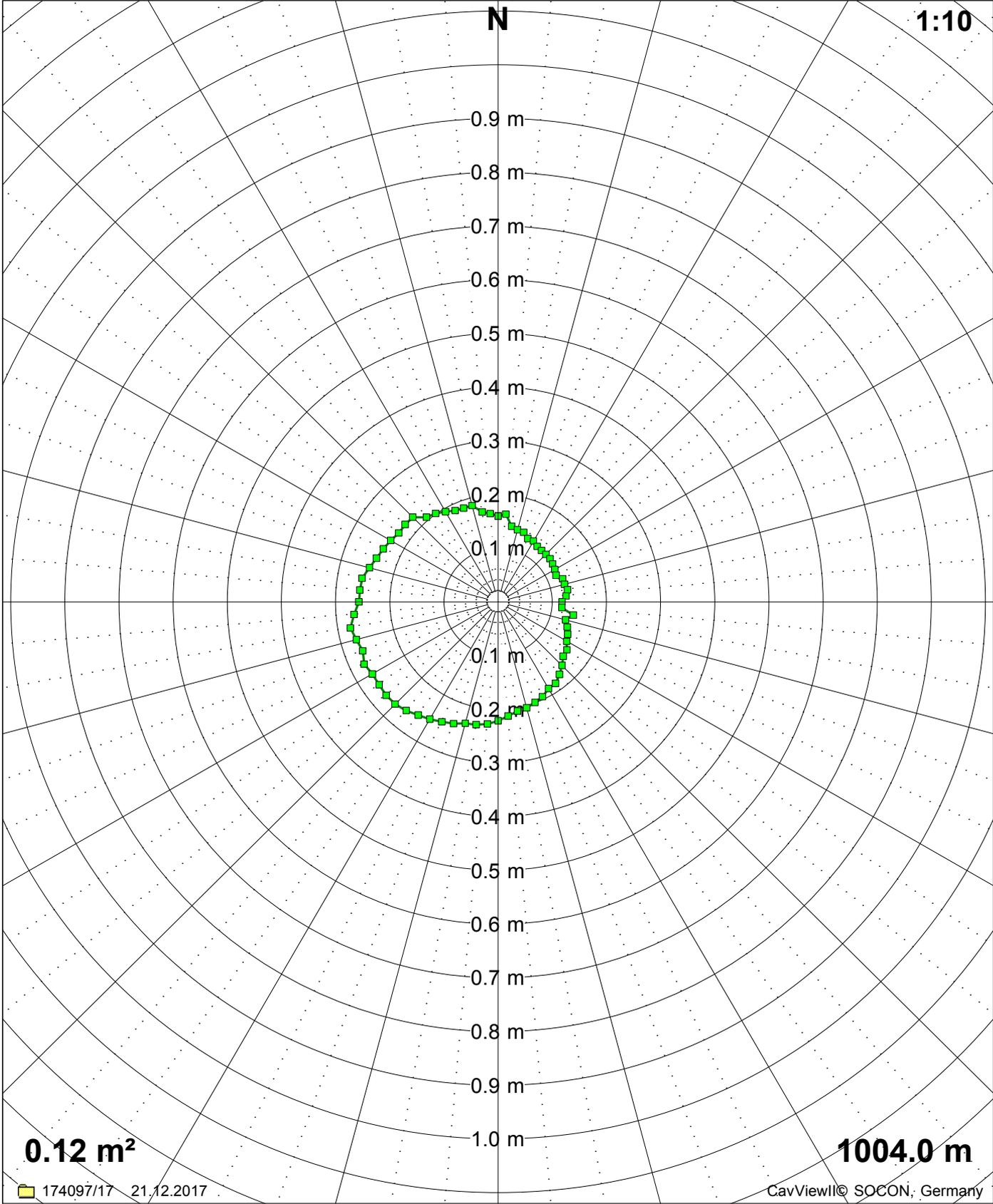
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.12 m²)

d_{max} : 0.39 m 65° <--> 245° r_{min} : 0.11 m -> 65° r_{\sim} : 0.20 m r_{max} : 0.28 m -> 250°

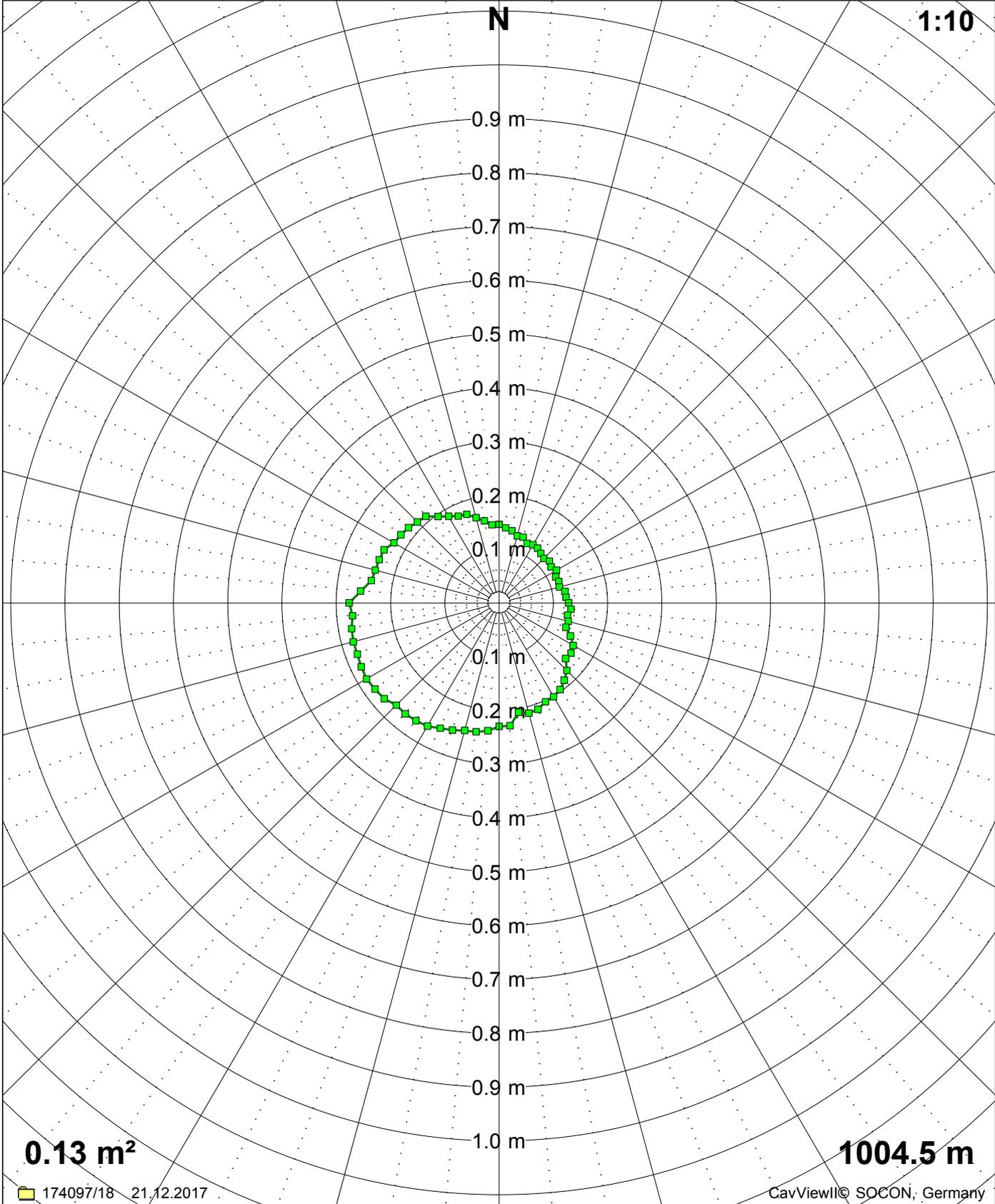
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.12 m²)

d_{\max} : 0.41 m 80° <--> 260° r_{\min} : 0.12 m -> 60° r_{\sim} : 0.20 m r_{\max} : 0.28 m -> 260°

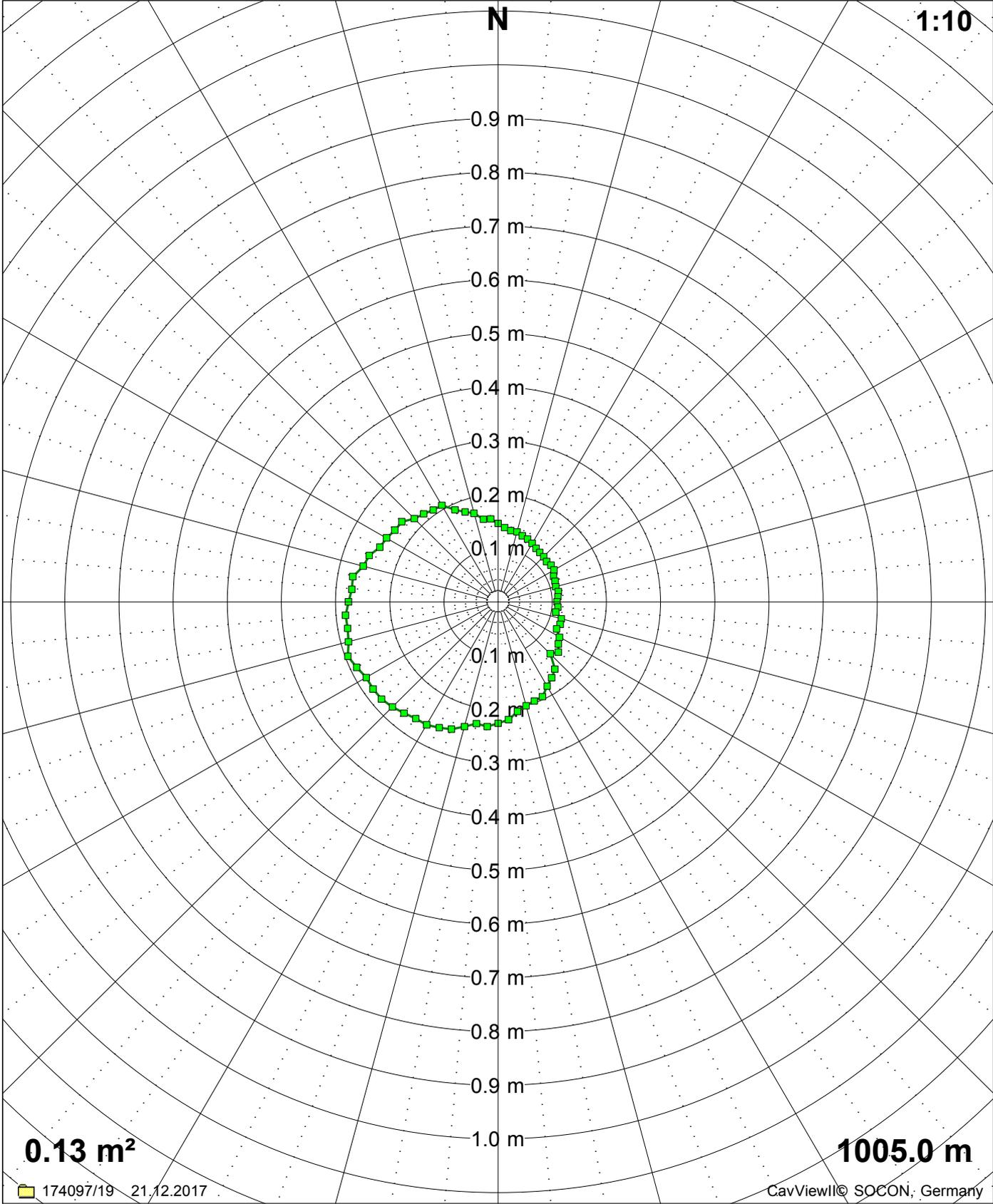
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.13 m²)

d_{max}: 0.40 m 90° <--> 270° r_{min}: 0.11 m -> 60° r~: 0.20 m r_{max}: 0.28 m -> 240°

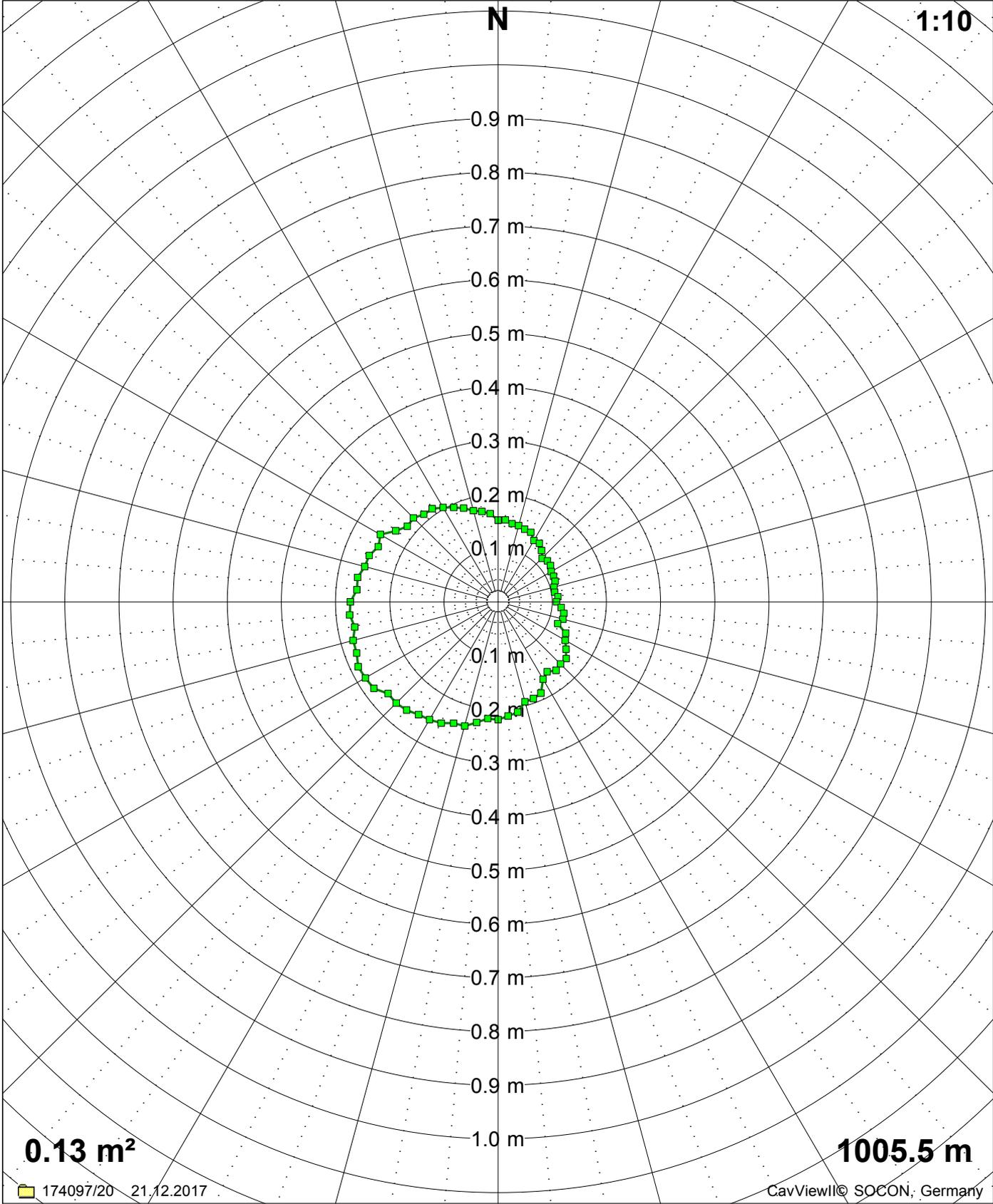
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.13 m²)

d_{\max} : 0.41 m 70° <--> 250° r_{\min} : 0.11 m -> 95° r_{\sim} : 0.20 m r_{\max} : 0.29 m -> 250°

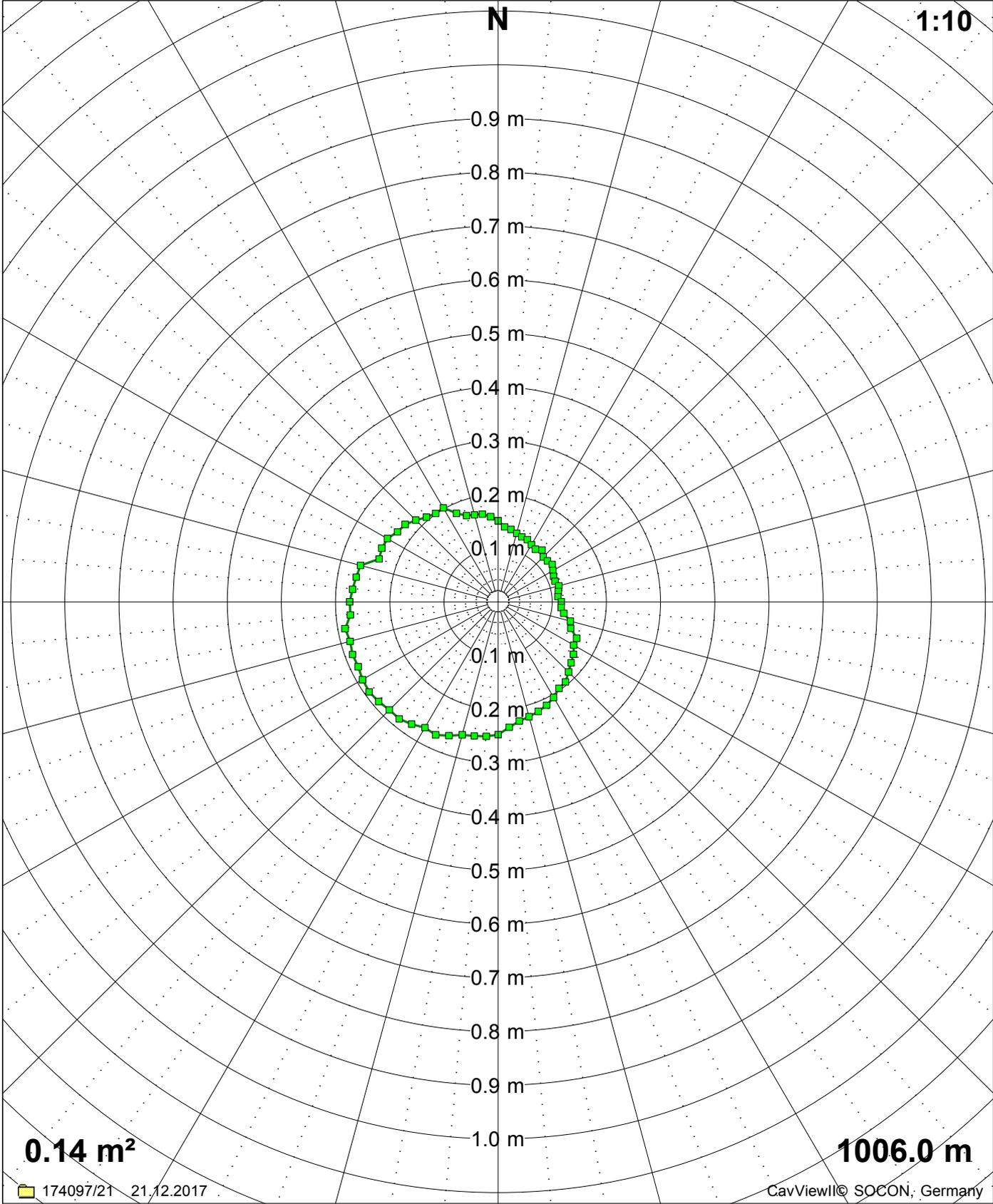
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.13 m²)

d_{max} : 0.40 m 55° <--> 235° r_{min} : 0.10 m -> 75° r_{\sim} : 0.20 m r_{max} : 0.28 m -> 245°

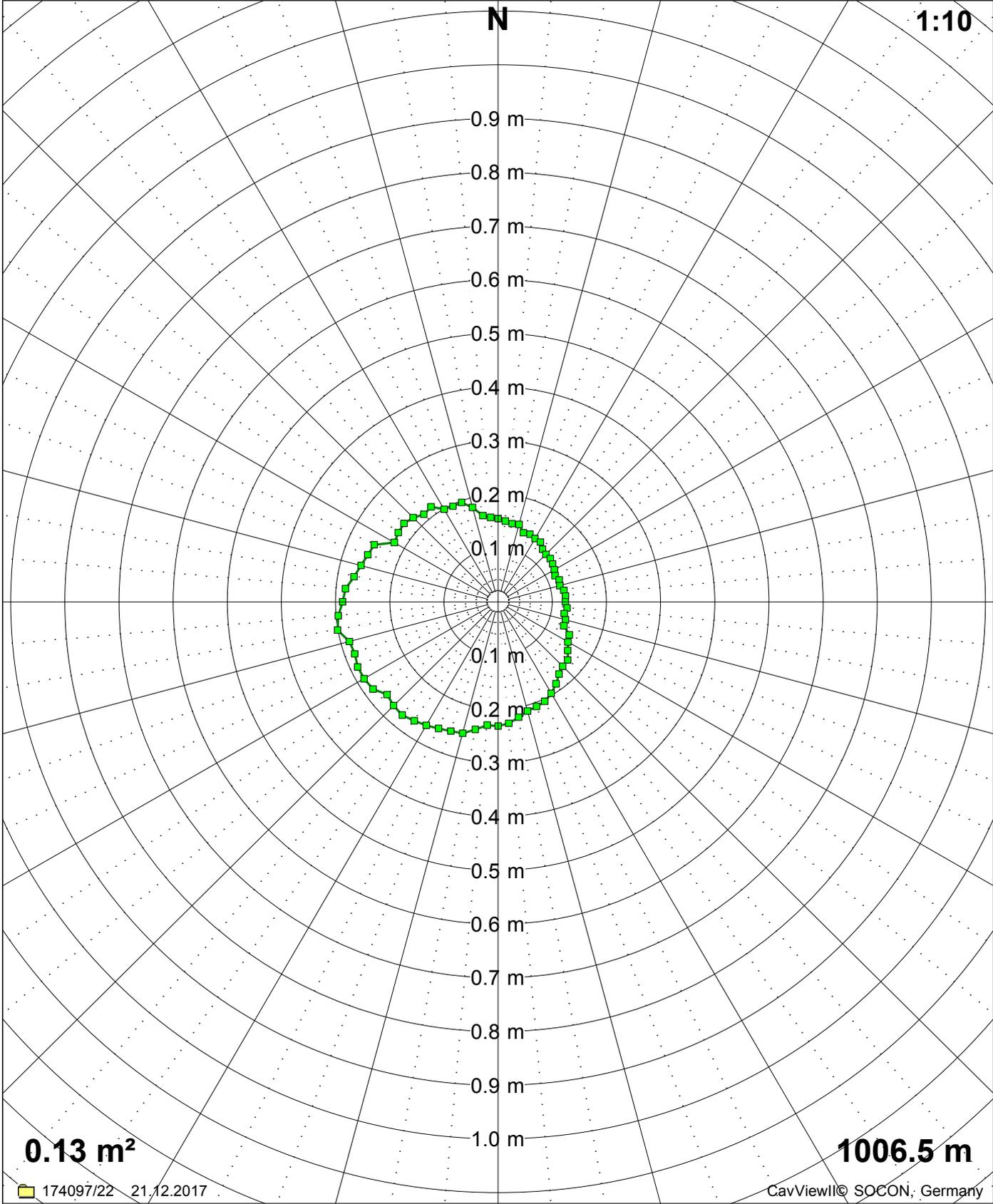
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.14 m²)

d_{max} : 0.41 m $55^\circ \leftrightarrow 235^\circ$ r_{min} : 0.11 m $\rightarrow 80^\circ$ r_{\sim} : 0.21 m r_{max} : 0.29 m $\rightarrow 235^\circ$

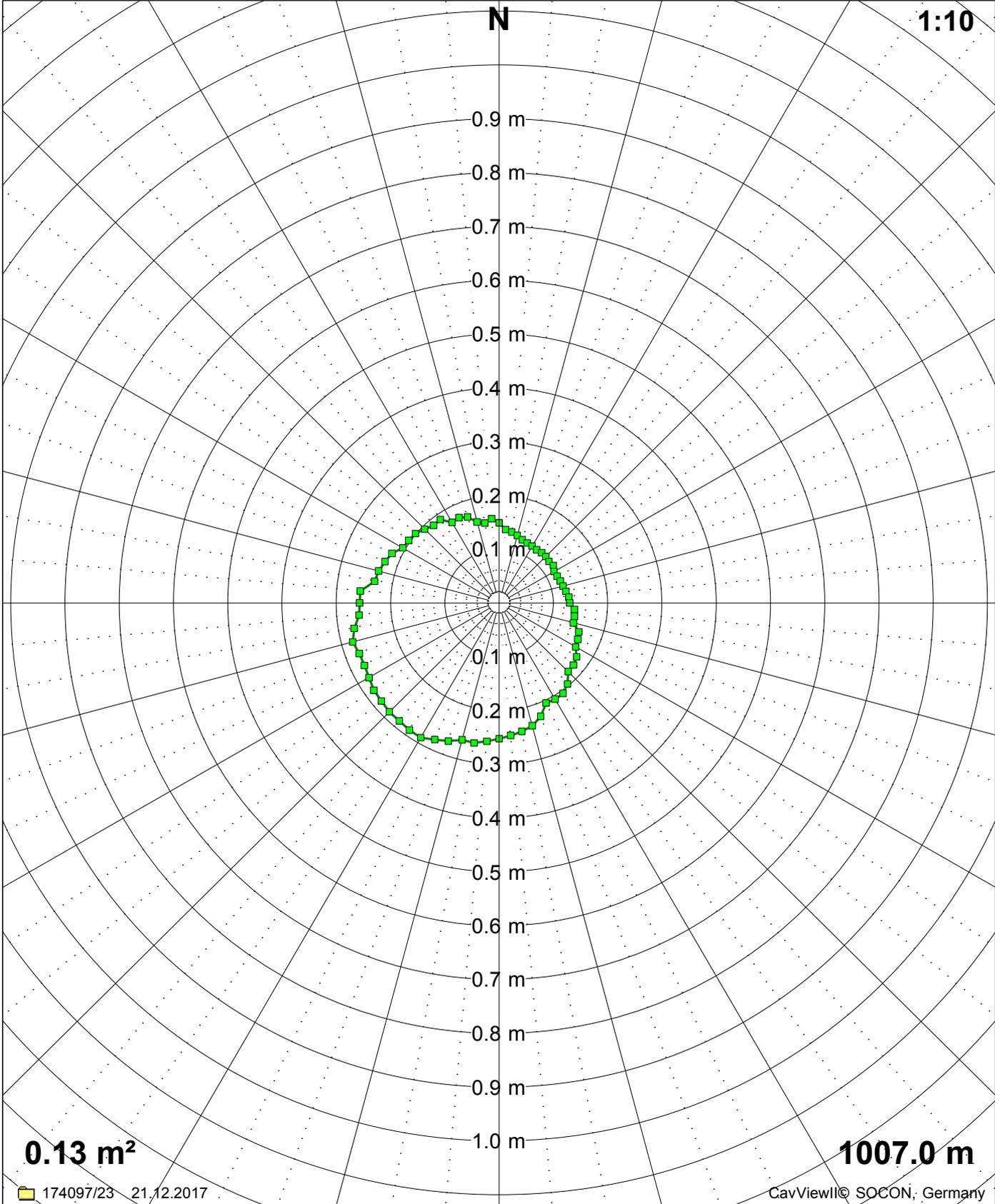
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.13 m²)

d_{max} : 0.42 m 80° <--> 260° r_{min} : 0.12 m -> 60° r_{\sim} : 0.21 m r_{max} : 0.30 m -> 260°

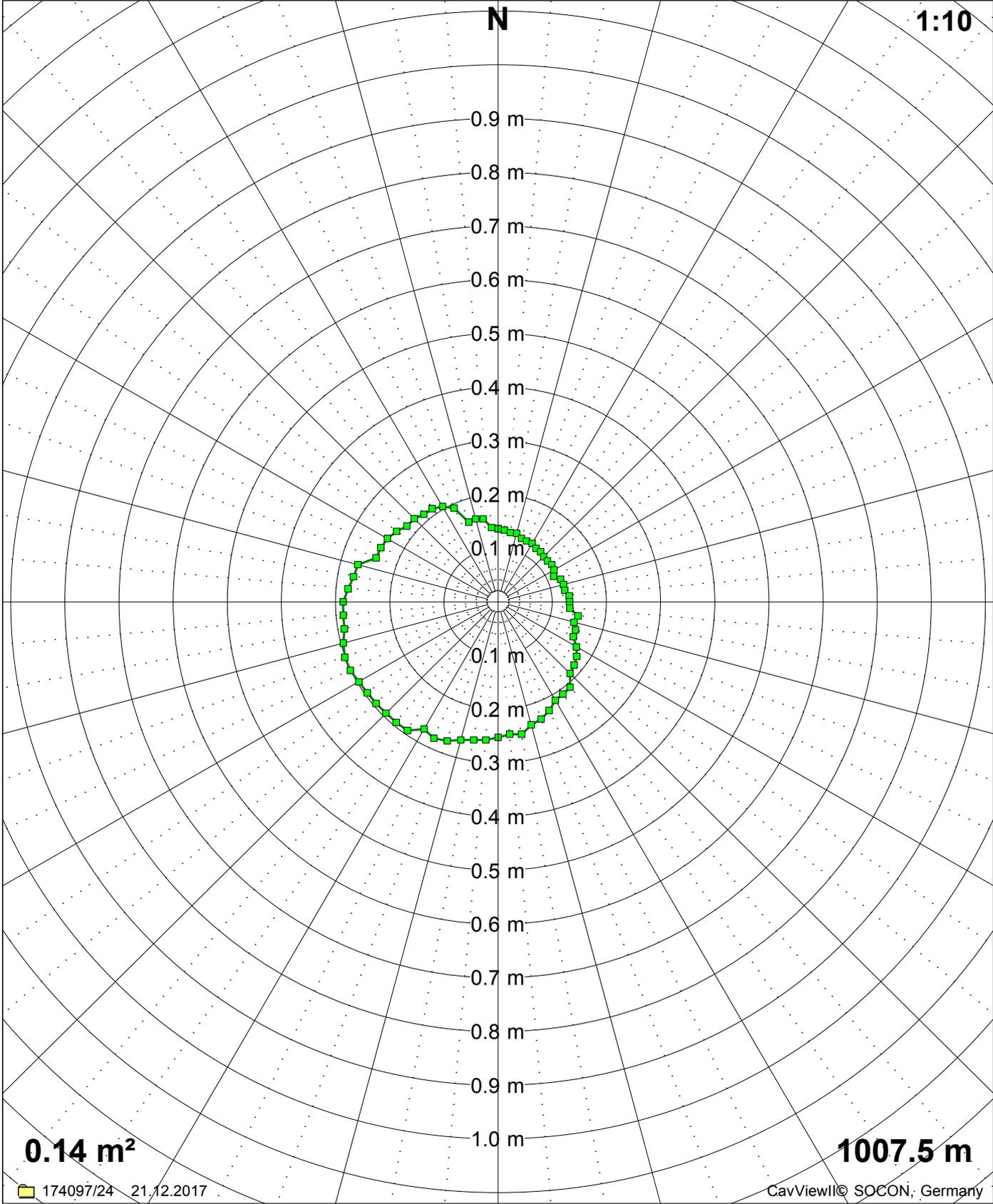
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.13 m²)

d_{max} : 0.41 m 30° <--> 210° r_{min} : 0.12 m -> 55° r_{\sim} : 0.20 m r_{max} : 0.29 m -> 210°

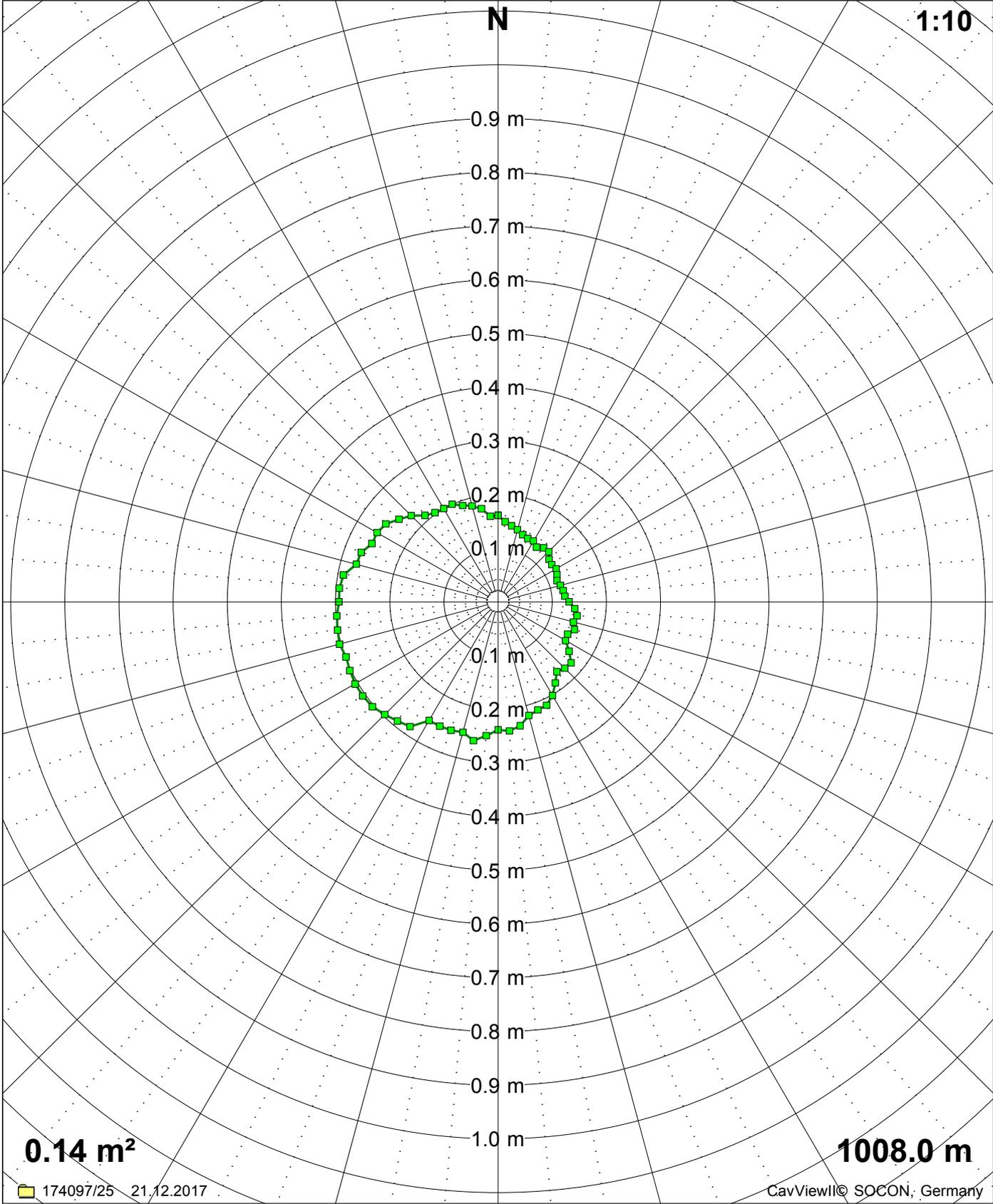
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.14 m²)

d_{\max} : 0.42 m 70° <--> 250° r_{\min} : 0.11 m -> 60° r_{\sim} : 0.21 m r_{\max} : 0.30 m -> 245°

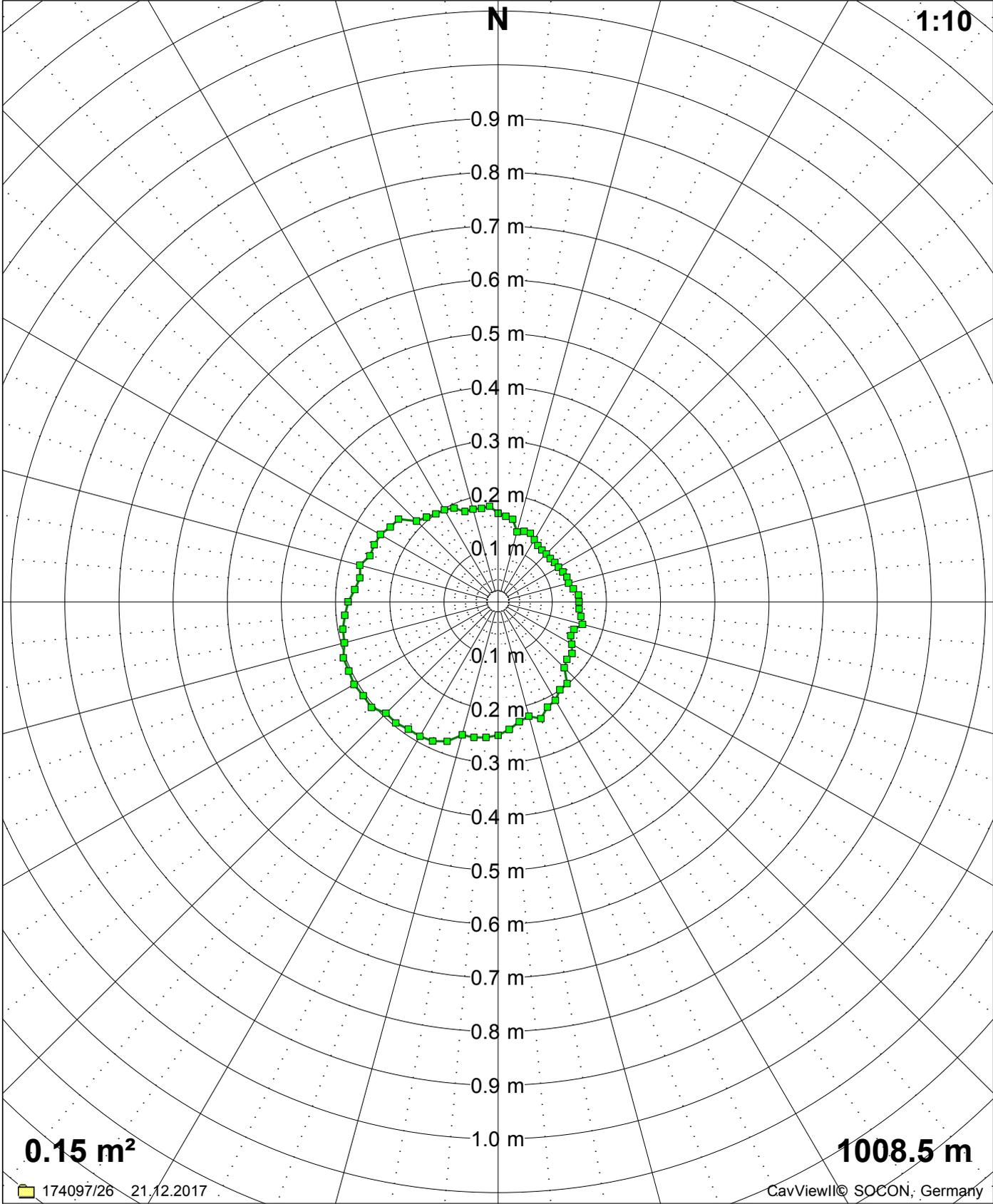
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.14 m²)

d_{max} : 0.44 m 100° <--> 280° r_{min} : 0.12 m -> 65° r_{\sim} : 0.21 m r_{max} : 0.30 m -> 235°

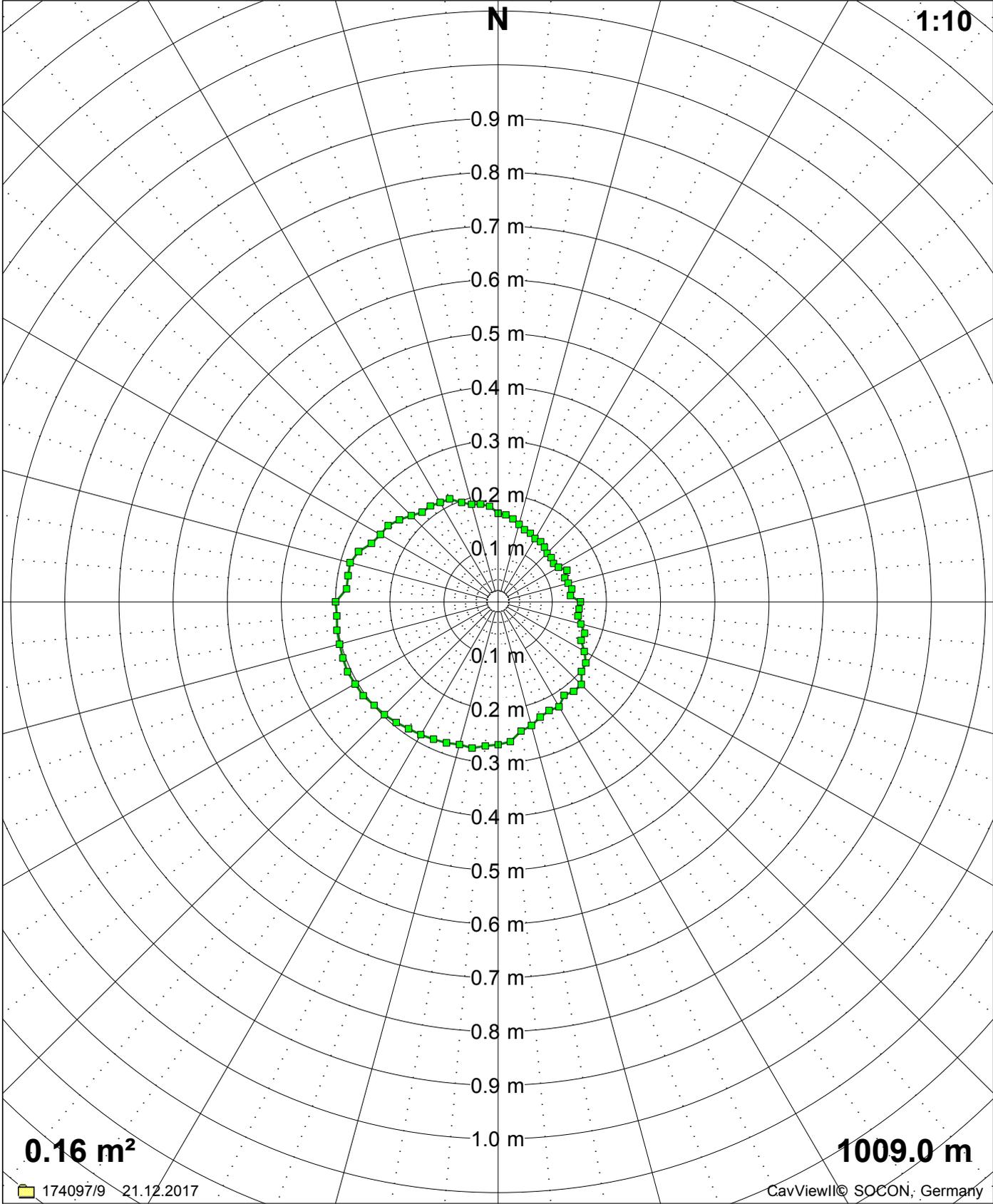
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.15 m²)

d_{max} : 0.44 m 70° <--> 250° r_{min} : 0.13 m -> 35° r_{\sim} : 0.22 m r_{max} : 0.31 m -> 240°

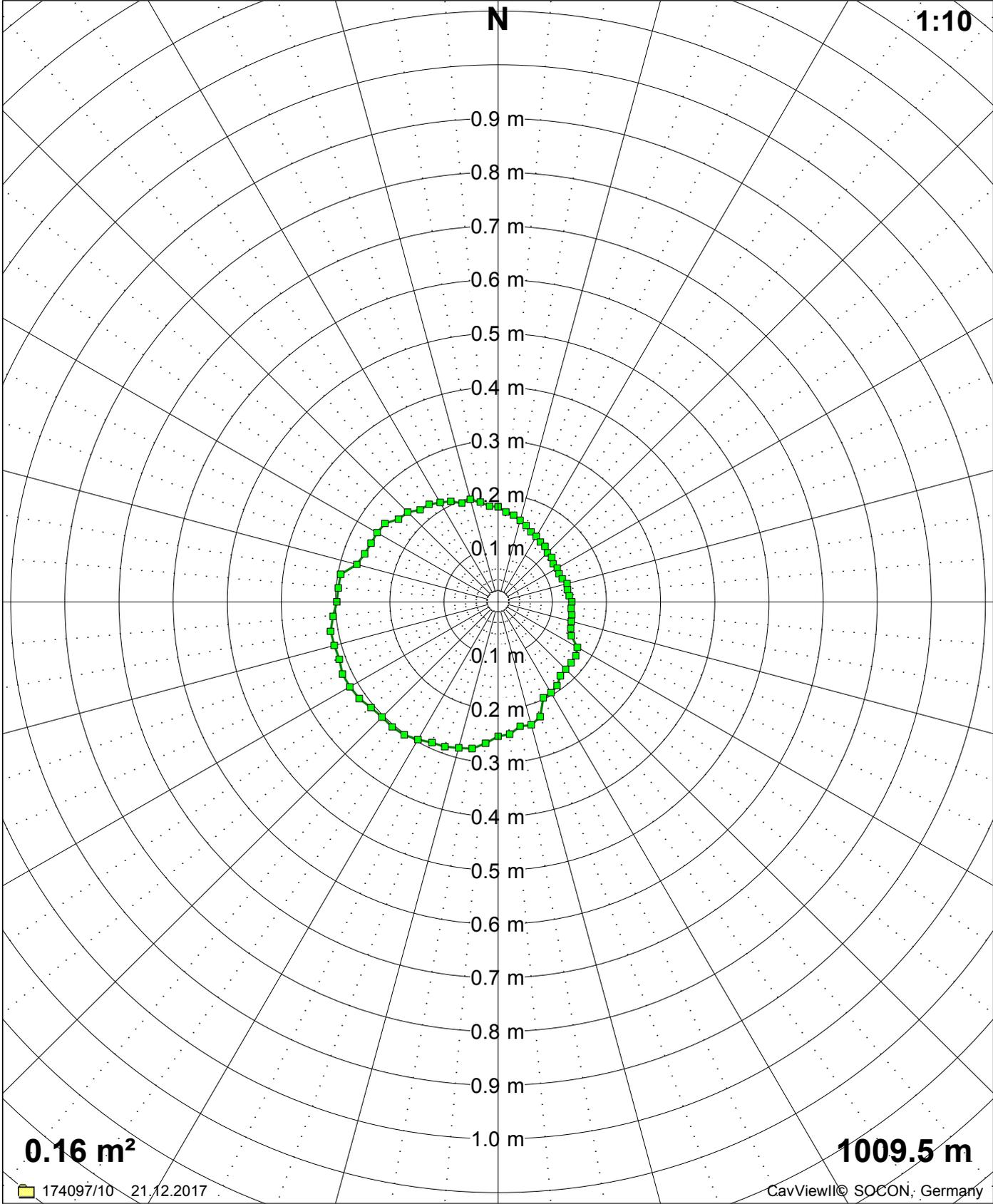
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.16 m²)

d_{max} : 0.45 m 90° <--> 270° r_{min} : 0.12 m -> 50° r_{\sim} : 0.22 m r_{max} : 0.31 m -> 245°

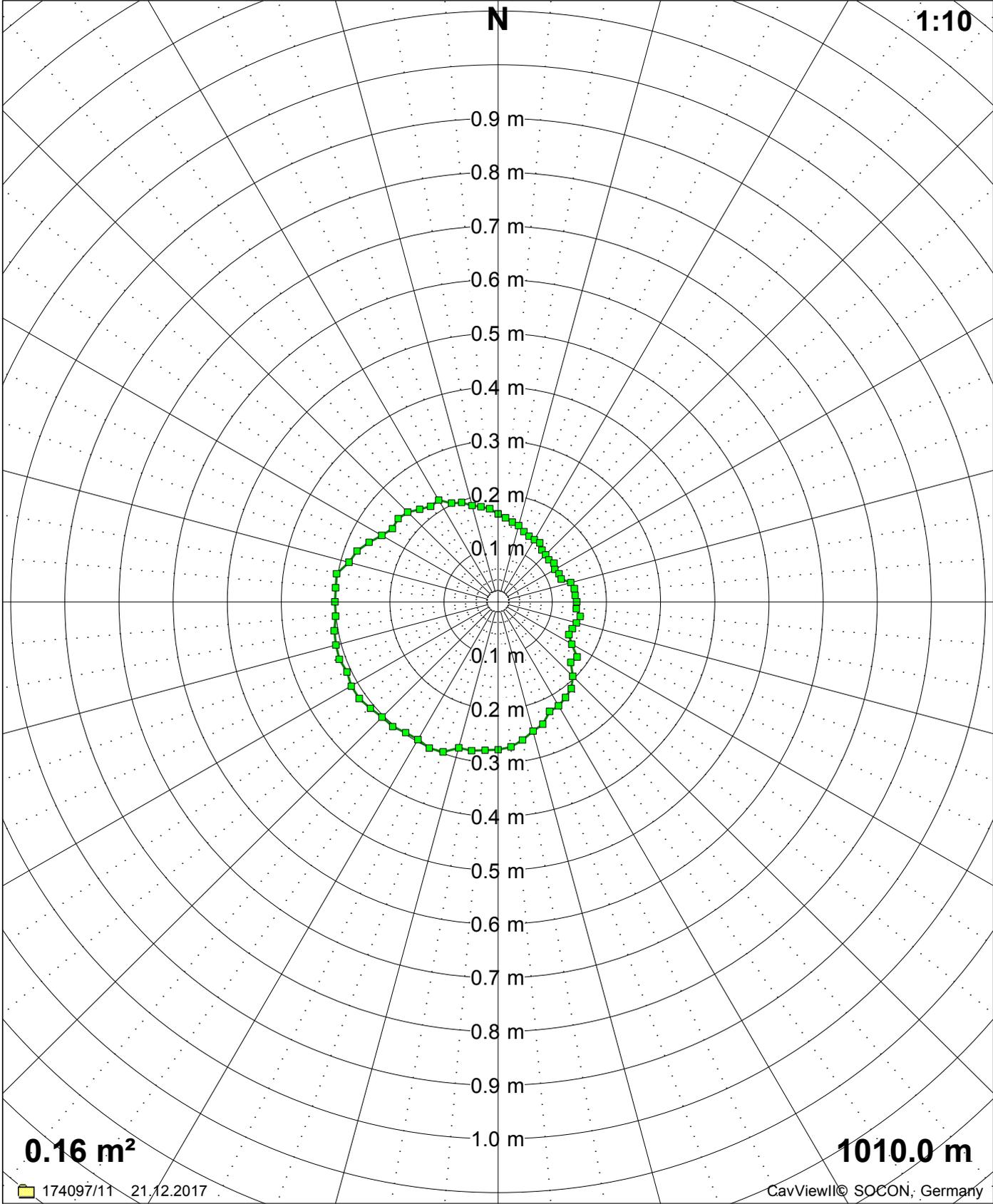
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.16 m²)

d_{max} : 0.45 m 75° <--> 255° r_{min} : 0.12 m -> 50° r_{\sim} : 0.22 m r_{max} : 0.32 m -> 245°

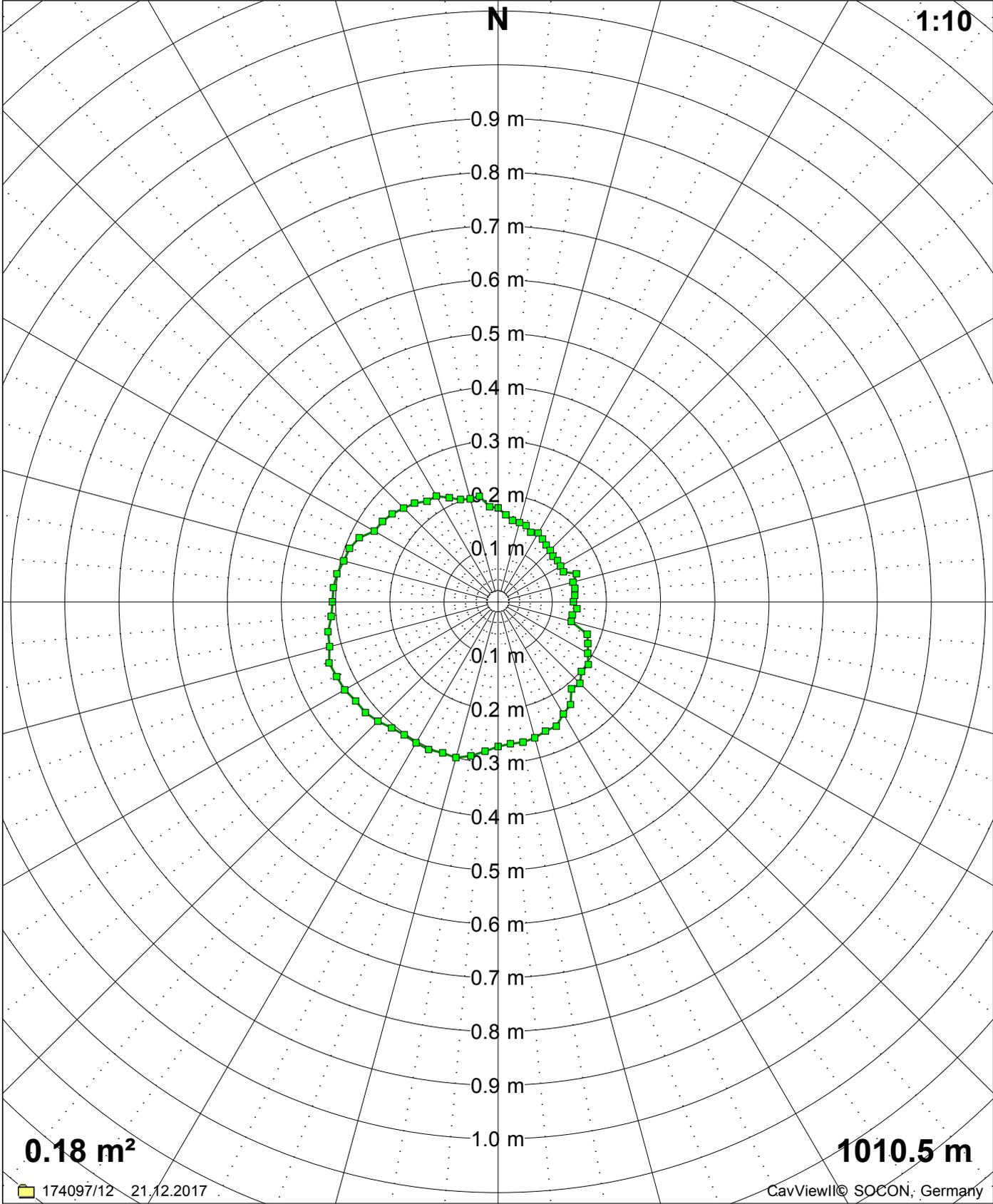
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.16 m²)

d_{max} : 0.46 m 100° <--> 280° r_{min} : 0.12 m -> 55° r_{\sim} : 0.23 m r_{max} : 0.31 m -> 235°

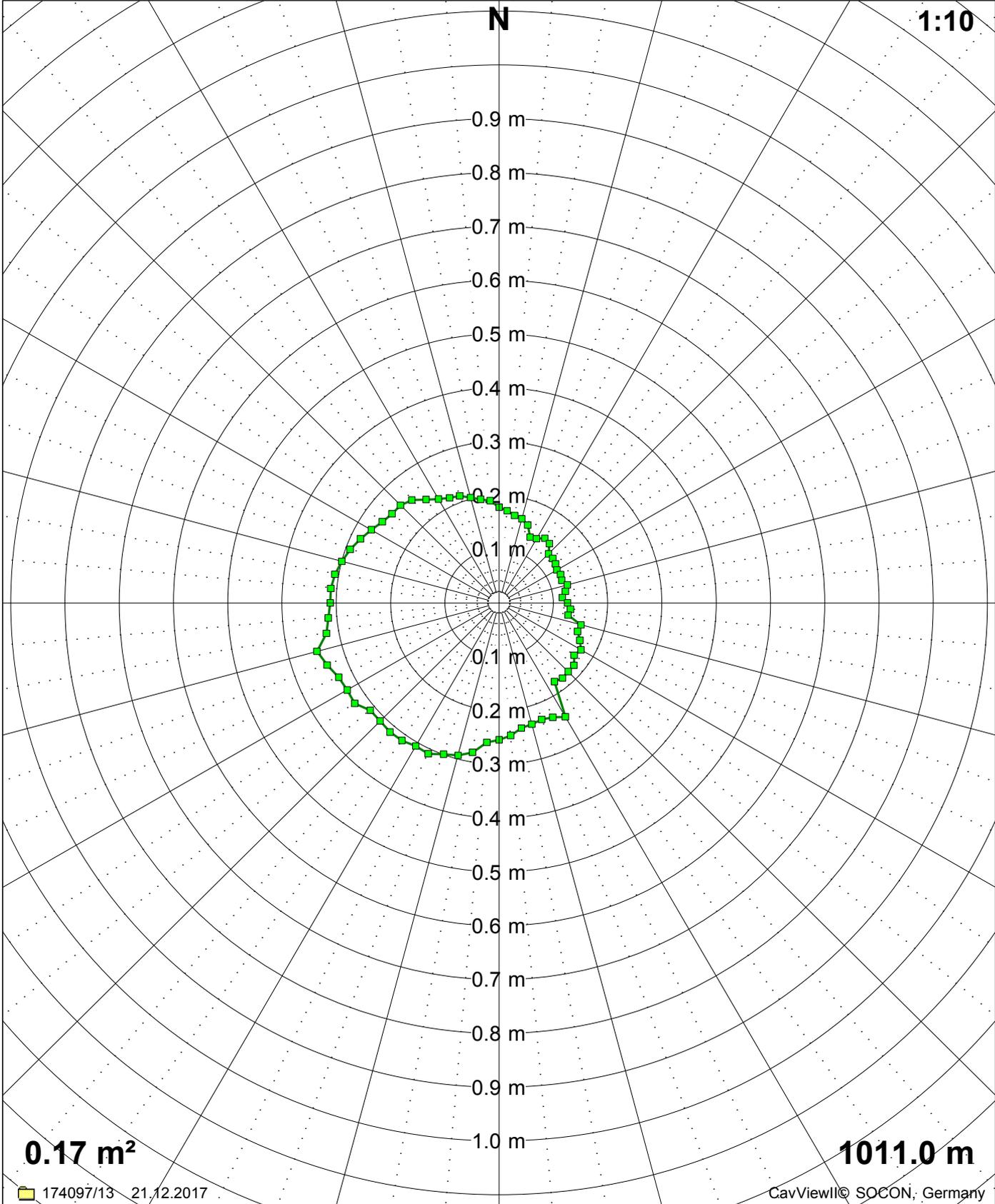
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.18 m²)

d_{max} : 0.49 m 70° <--> 250° r_{min} : 0.13 m -> 45° r_{\sim} : 0.24 m r_{max} : 0.33 m -> 250°

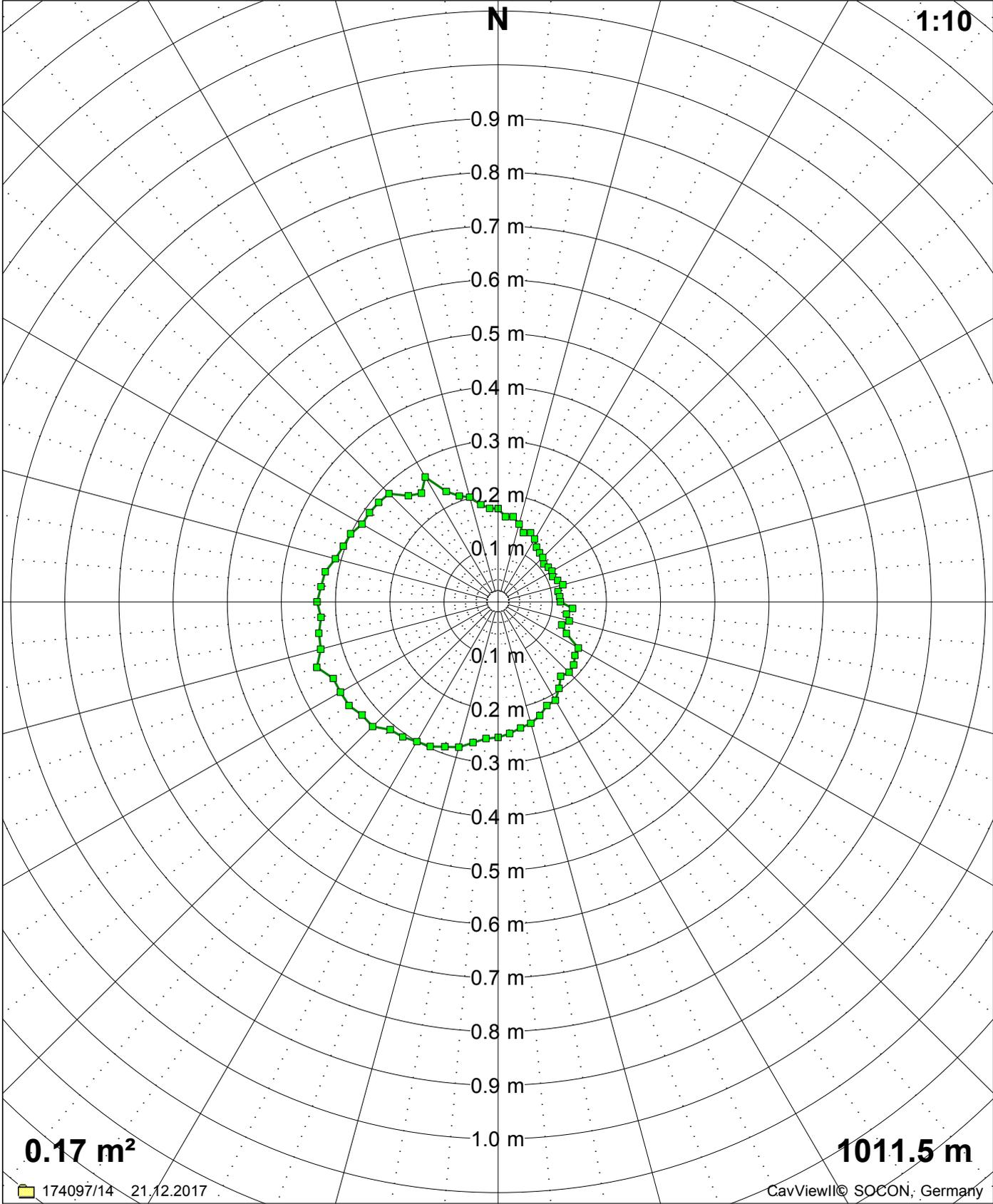
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.17 m²)

d_{\max} : 0.48 m 75° <--> 255° r_{\min} : 0.12 m -> 80° r_{\sim} : 0.23 m r_{\max} : 0.35 m -> 255°

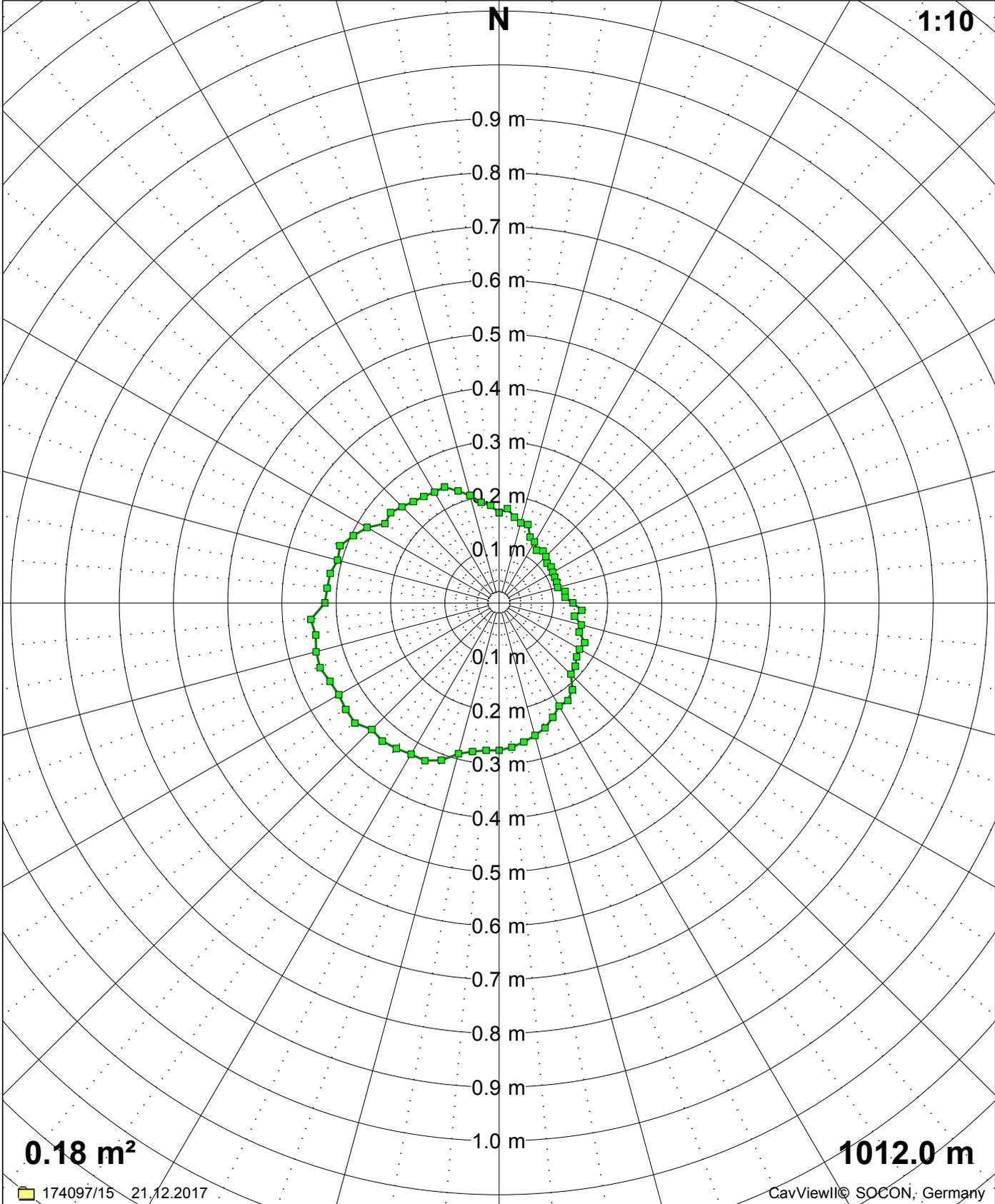
Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.17 m²)

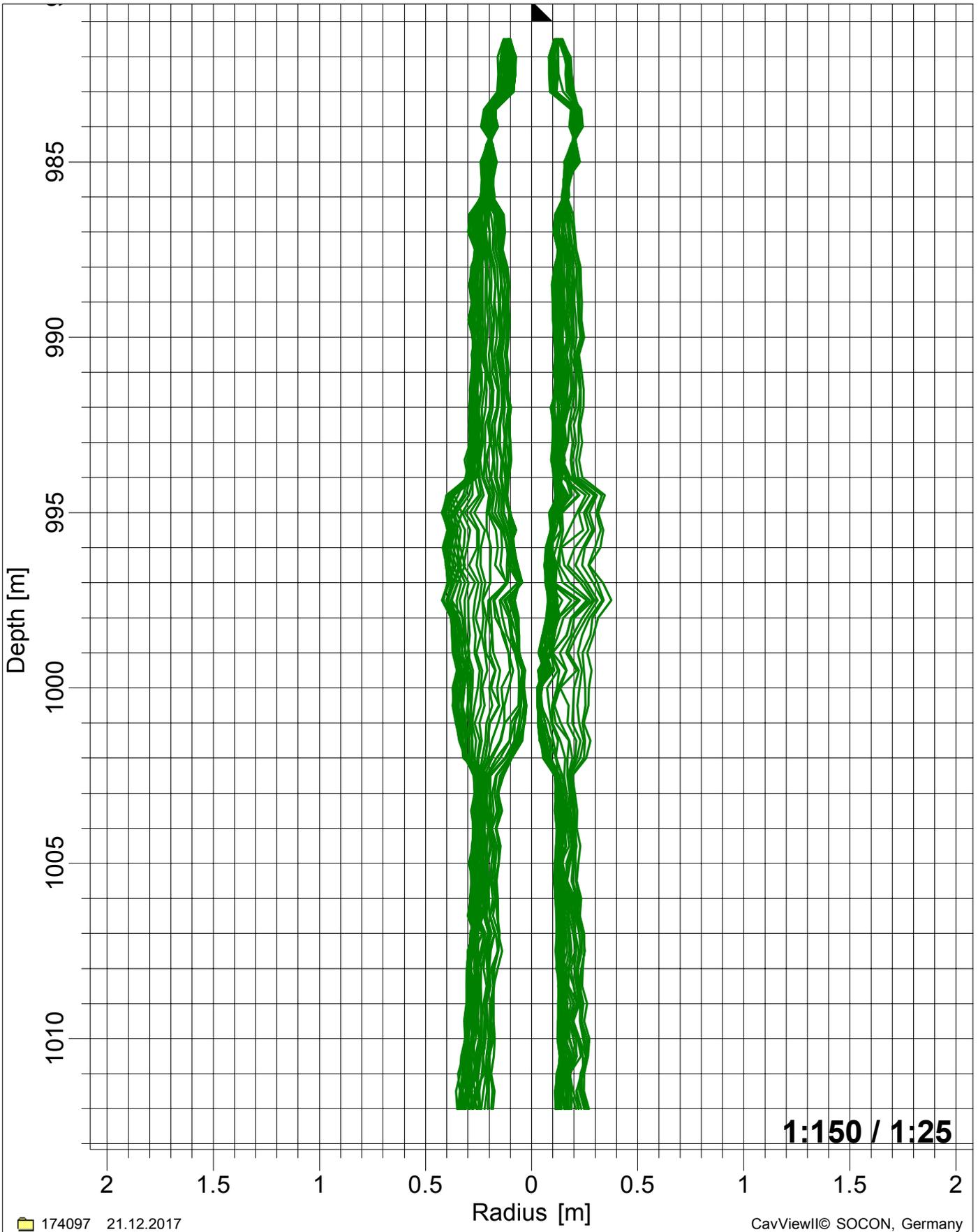
d_{max} : 0.48 m 150° ↔ 330° r_{min} : 0.11 m → 45° r_{\sim} : 0.24 m r_{max} : 0.36 m → 250°

Heiligerlee K **21.12.2017**



—■— (21.12.2017) (0.18 m²)

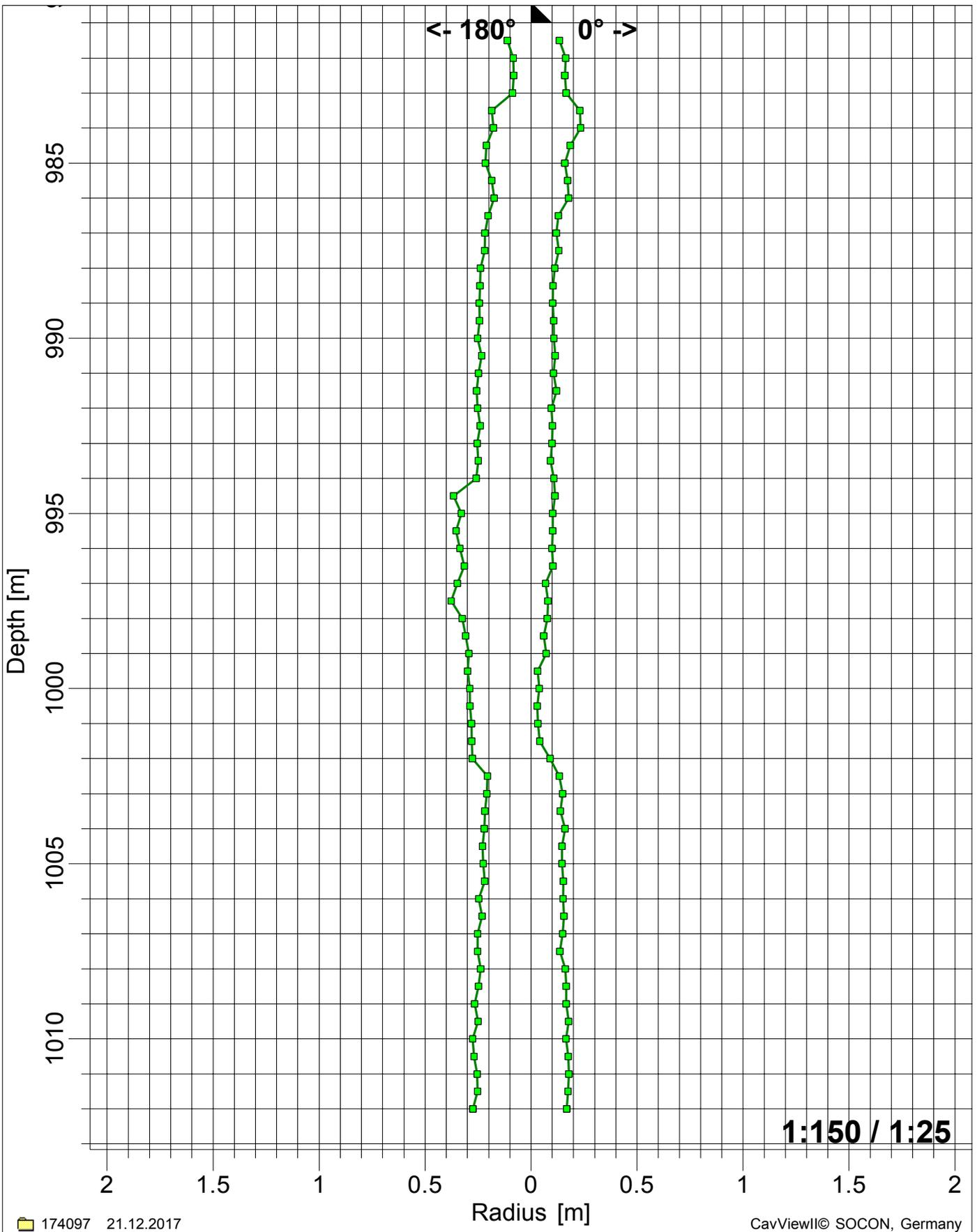
d_{max} : 0.47 m 155° <--> 335° r_{min} : 0.11 m -> 70° r_{\sim} : 0.24 m r_{max} : 0.35 m -> 250°



10 3/4" : 981.0 m

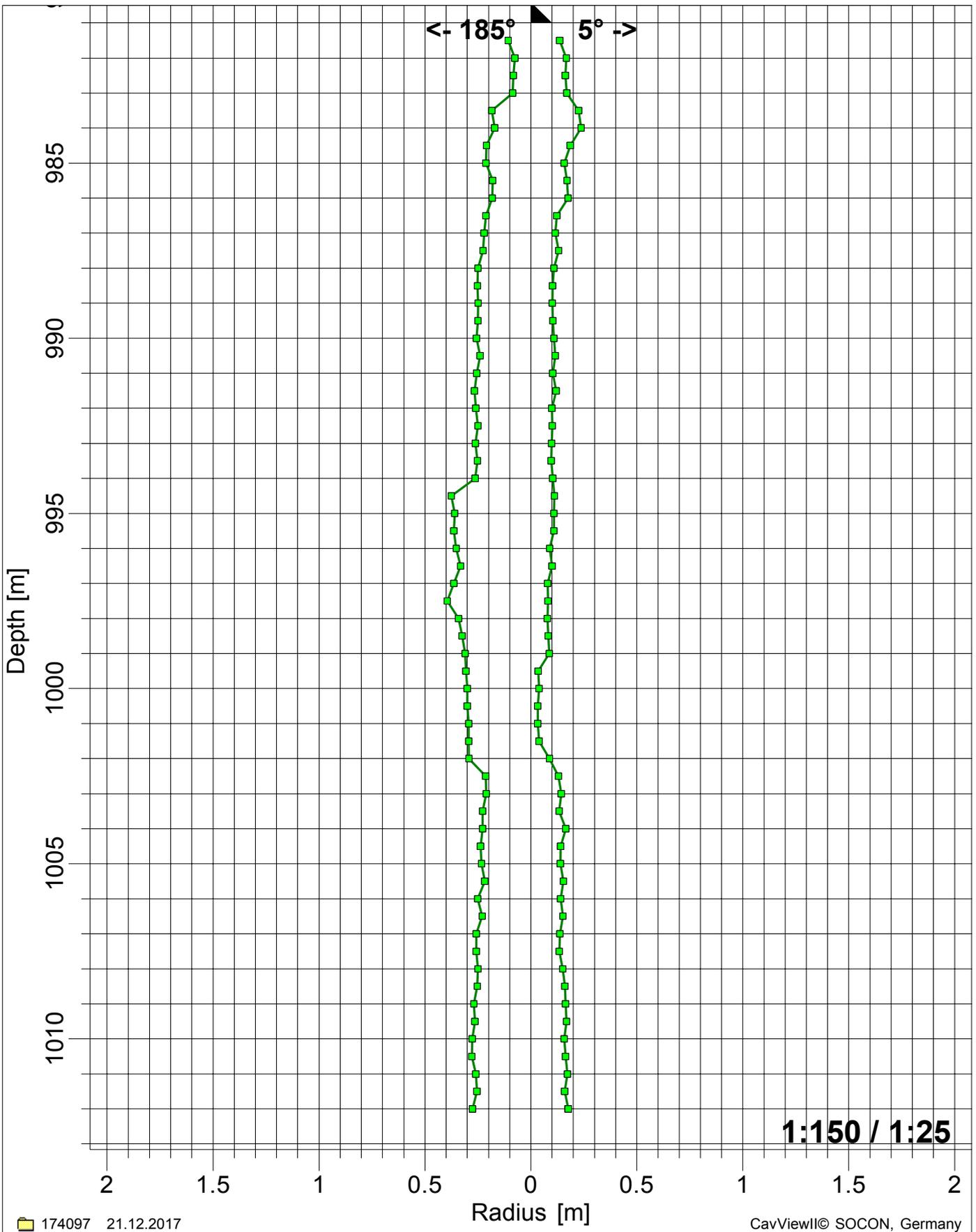
Heiligerlee K

21.12.2017



Heiligerlee K

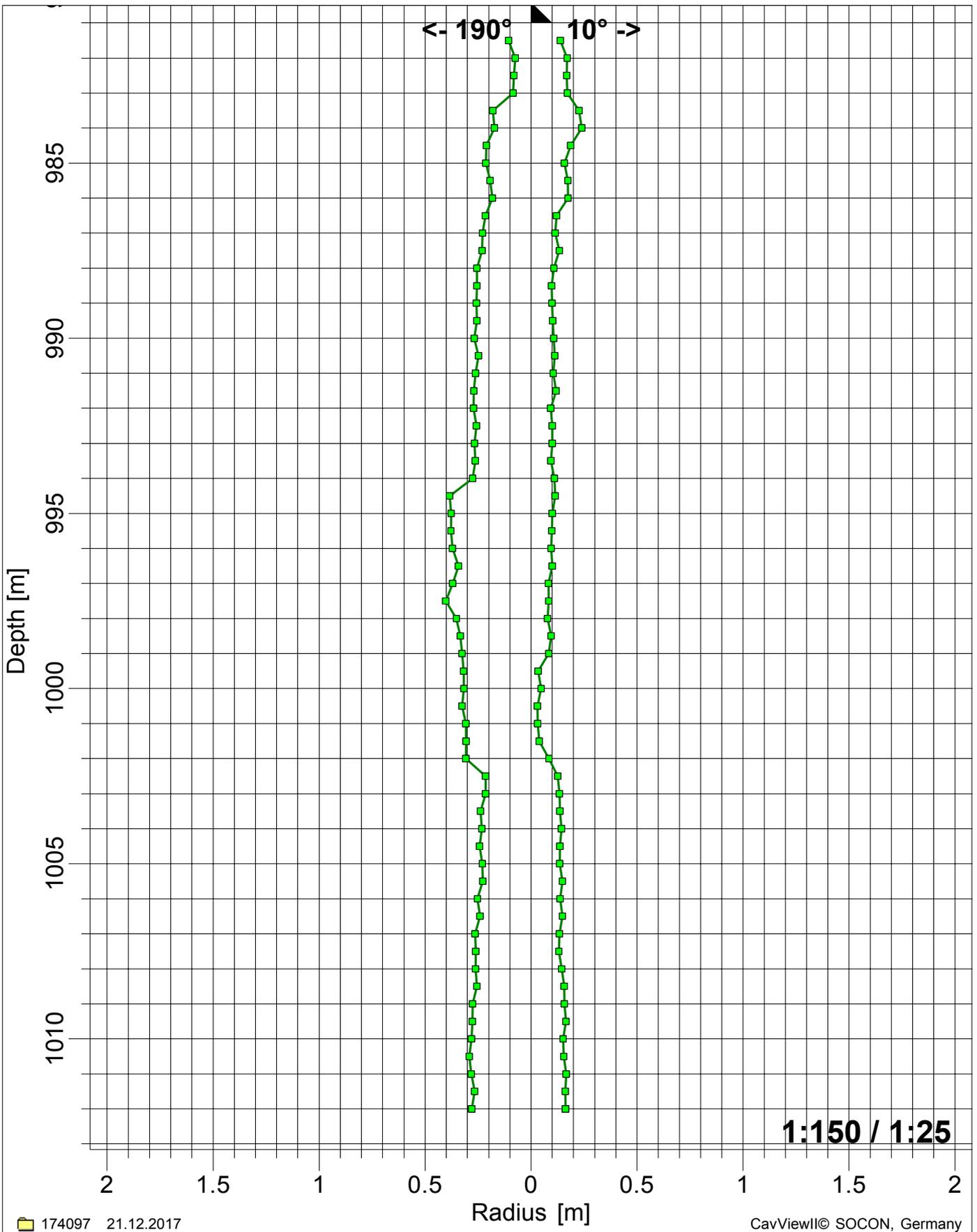
21.12.2017



 (21.12.2017)	 10 3/4" : 981.0 m
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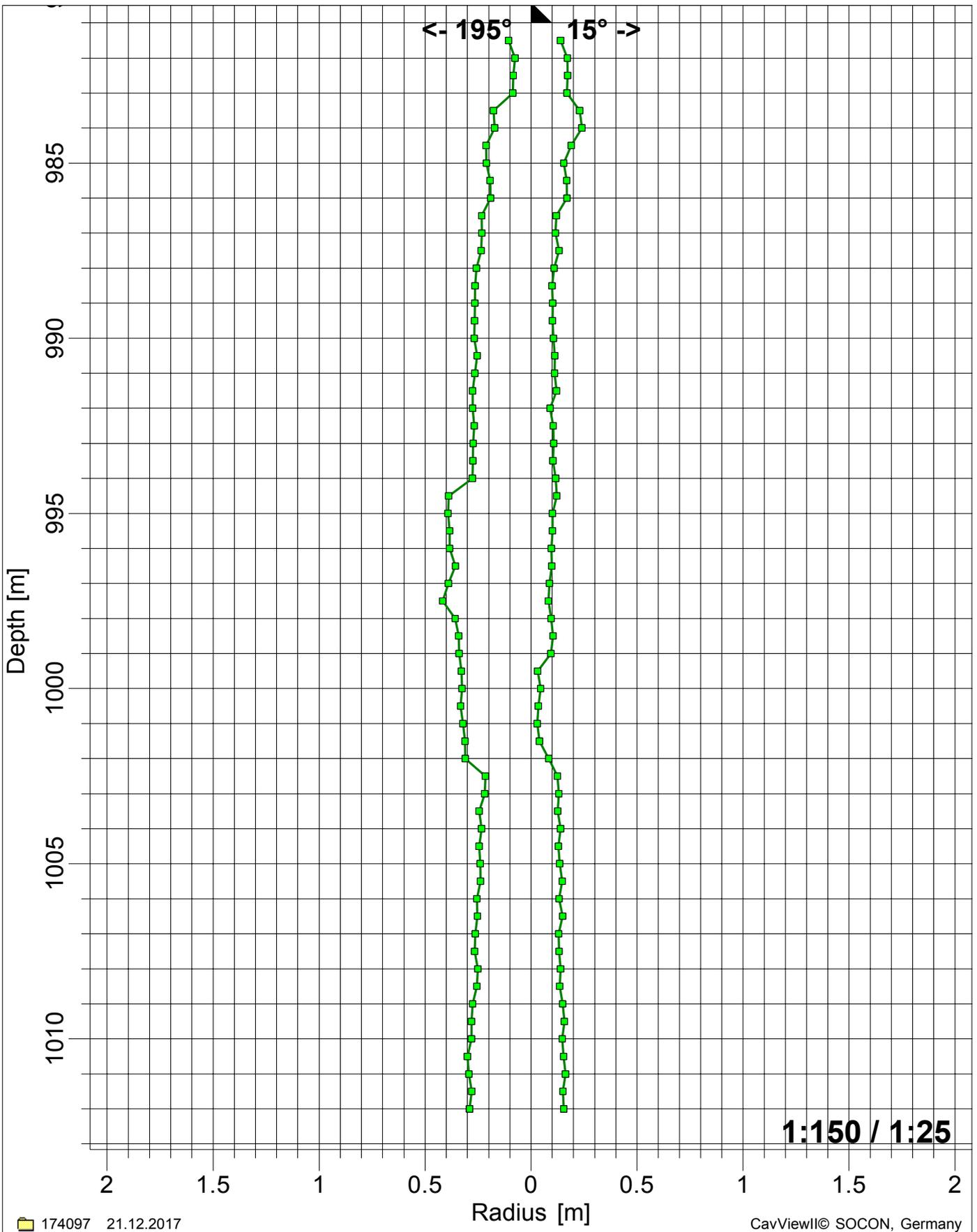
Heiligerlee K

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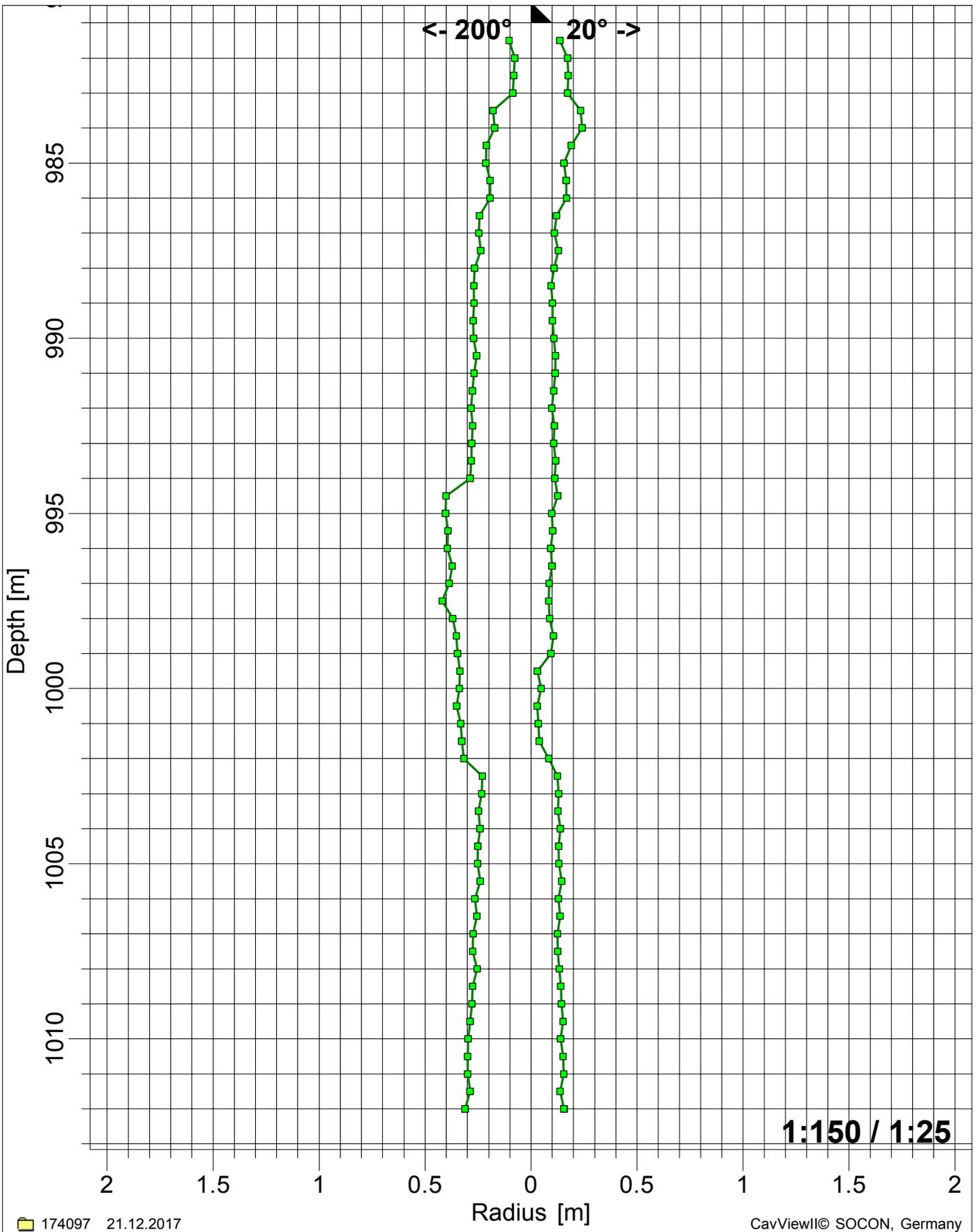
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21.12.2017



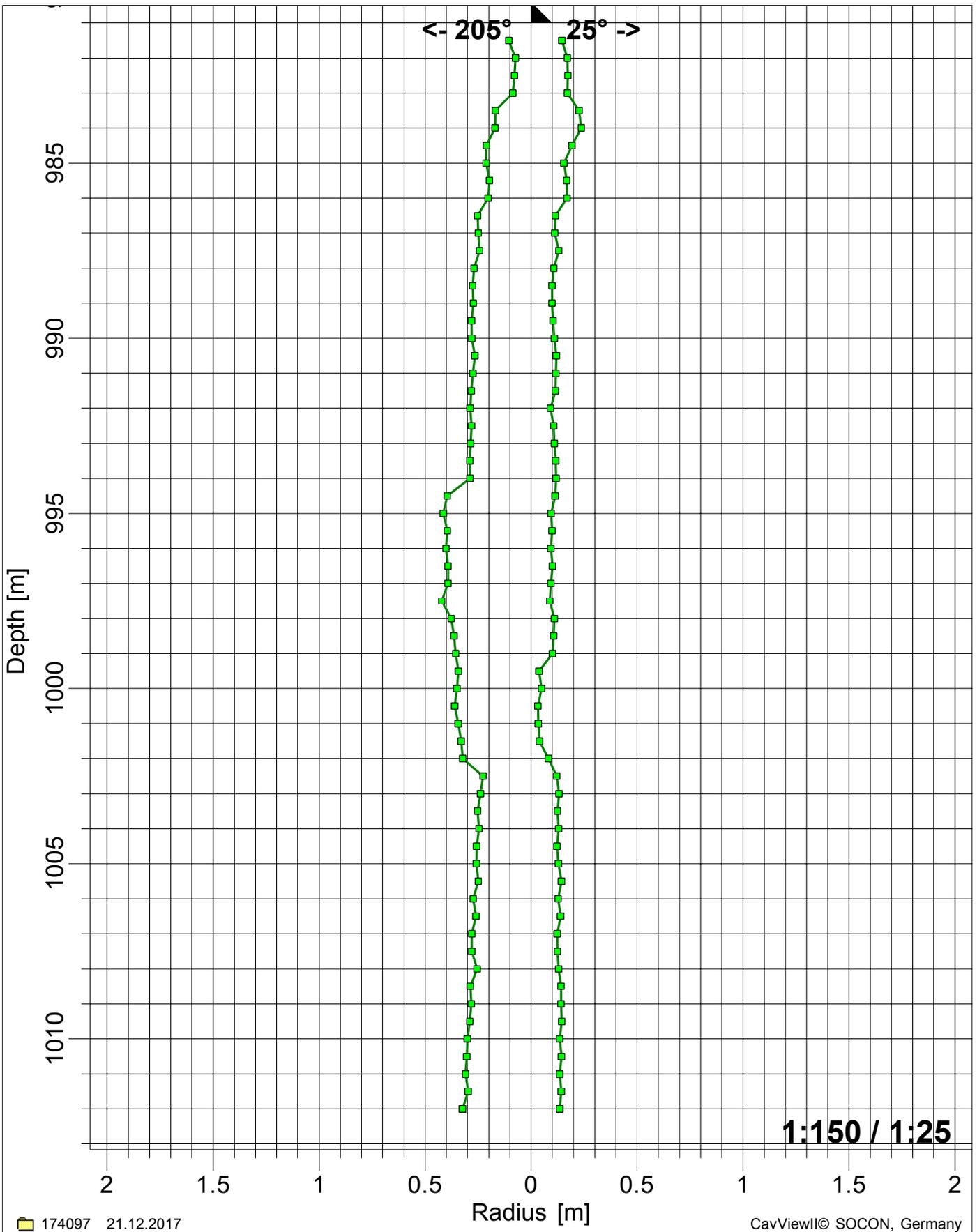
Heiligerlee K

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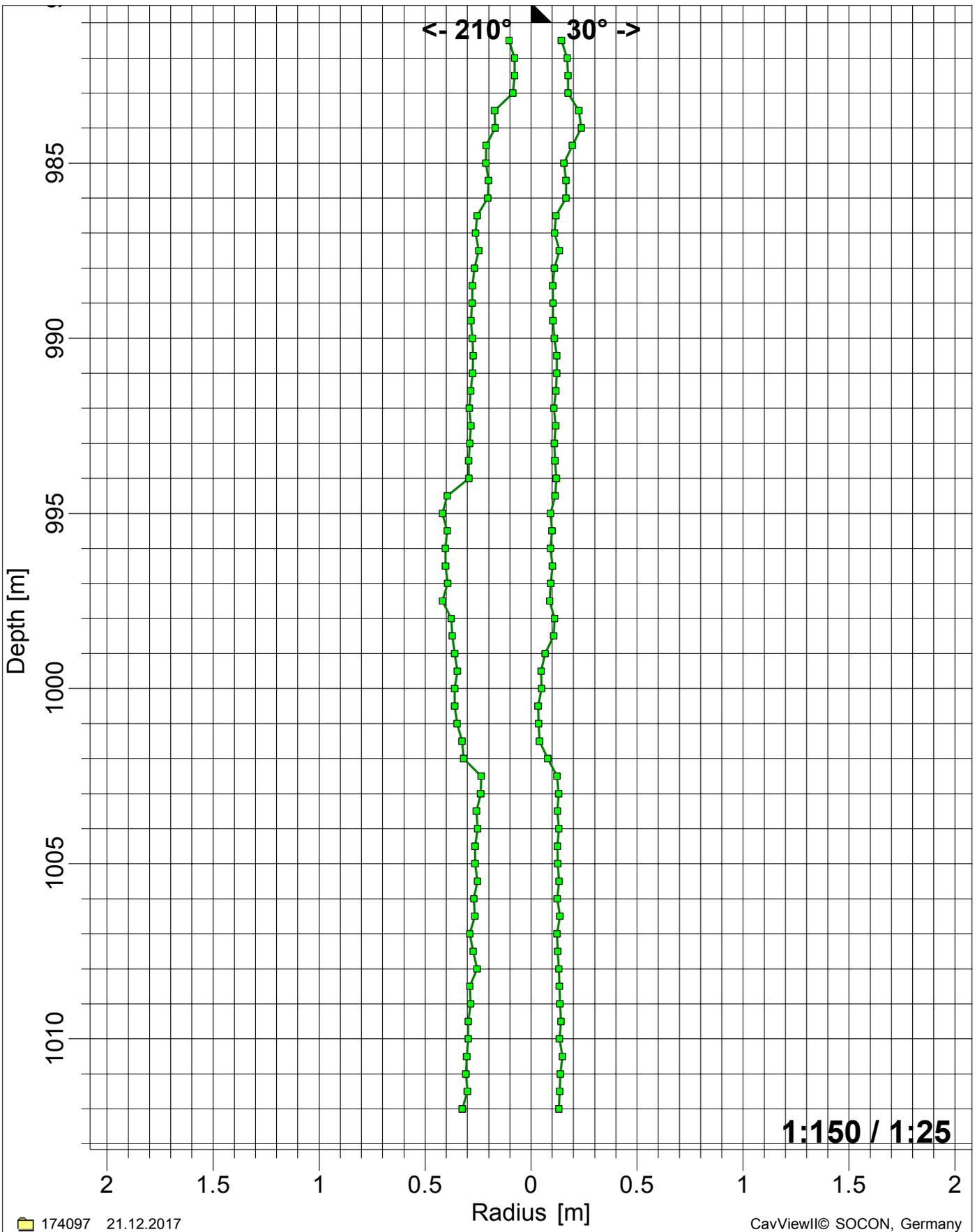
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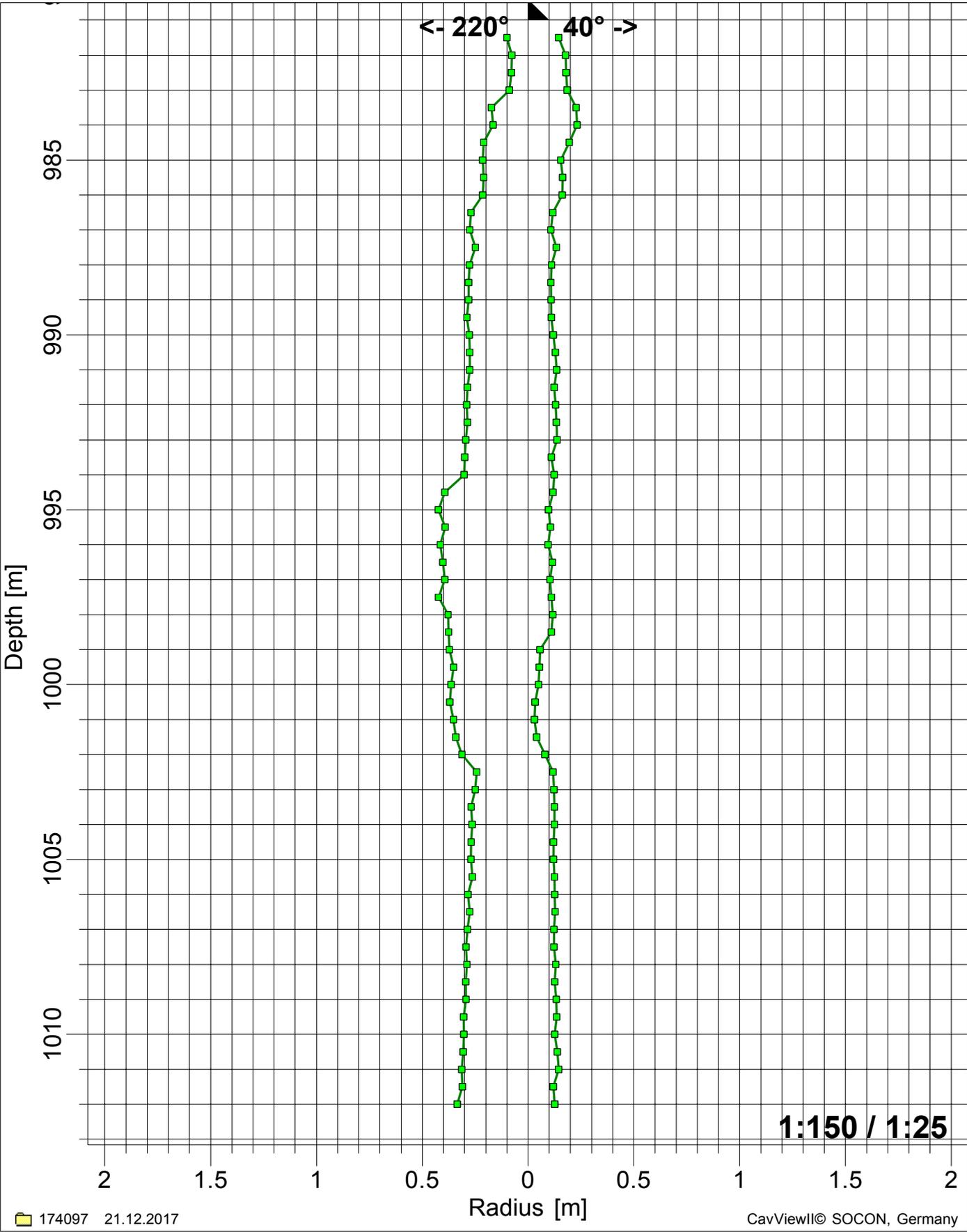
Heiligerlee K

21.12.2017



 (21.12.2017)	 10 3/4" : 981.0 m
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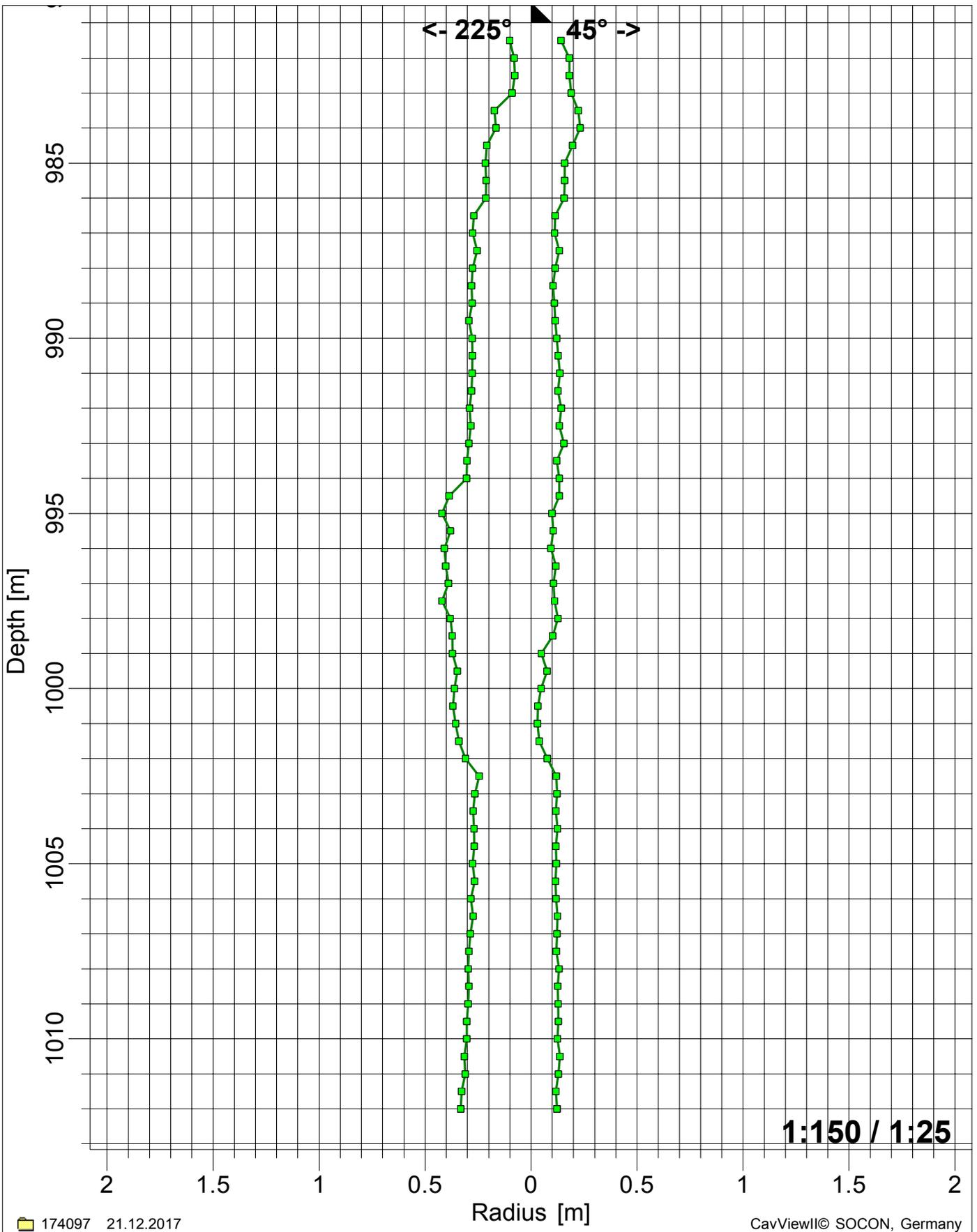
Heiligerlee K **21.12.2017**



—■— (21.12.2017)	▲ 10 3/4" : 981.0 m
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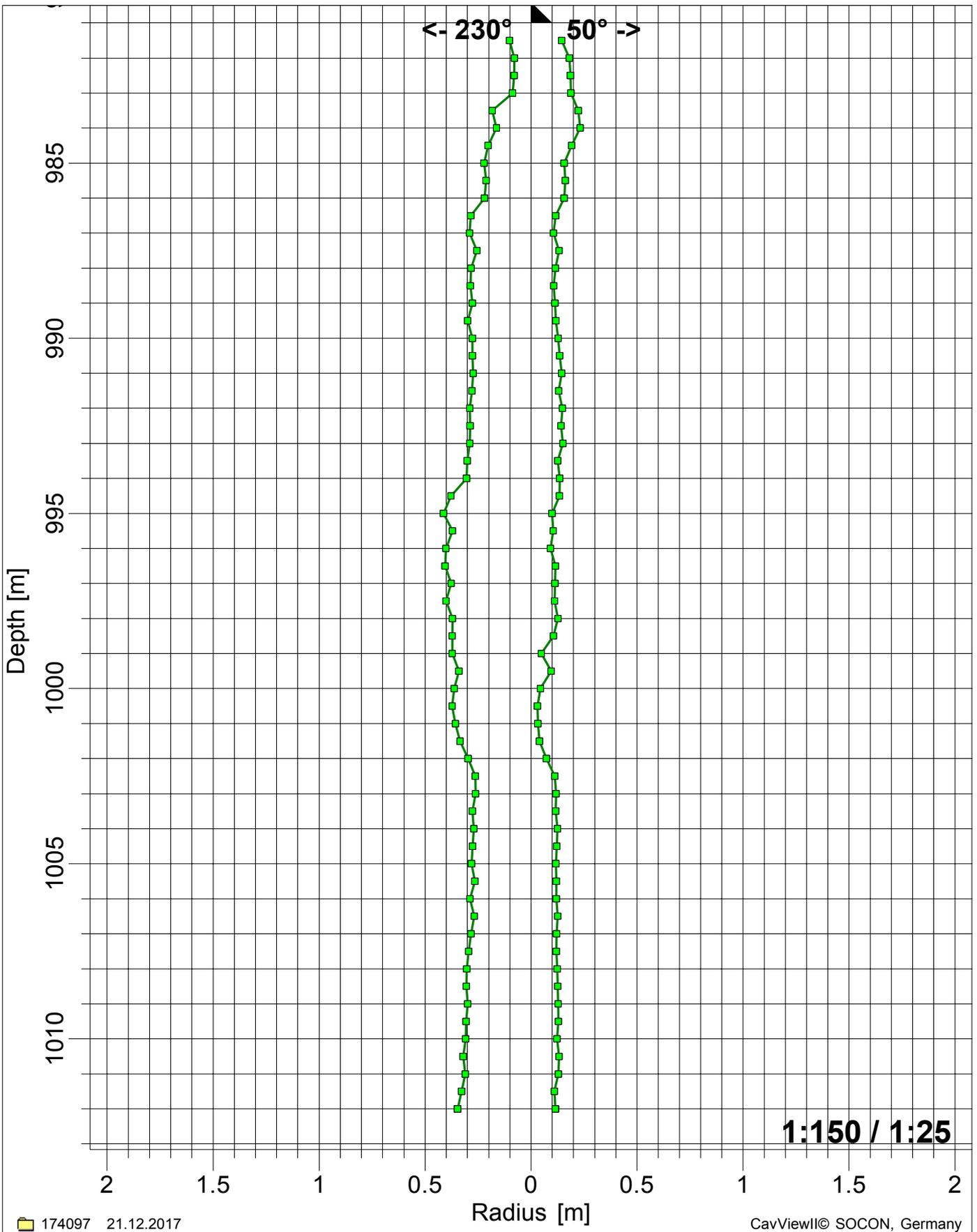
Heiligerlee K

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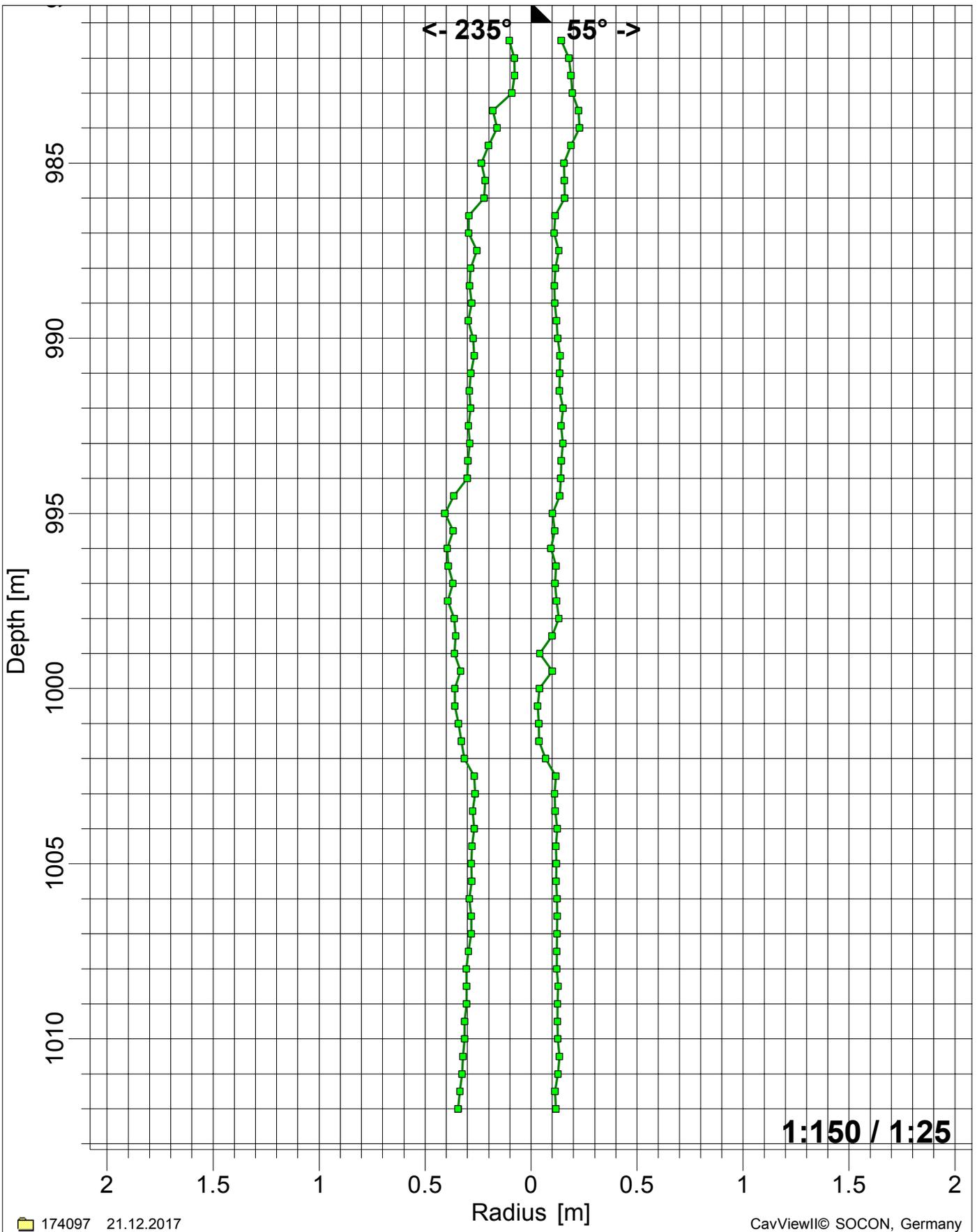
Heiligerlee K

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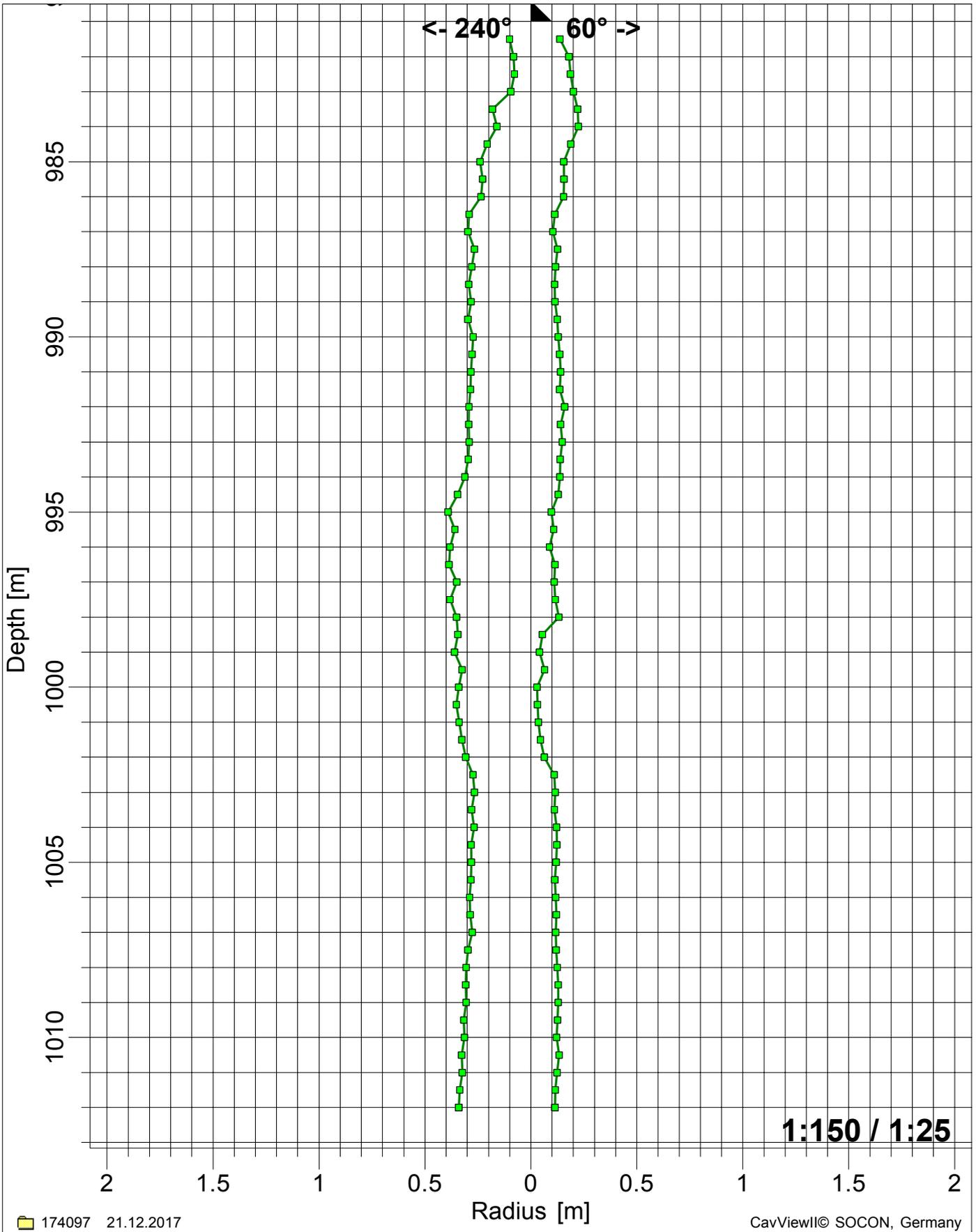


Heiligerlee K

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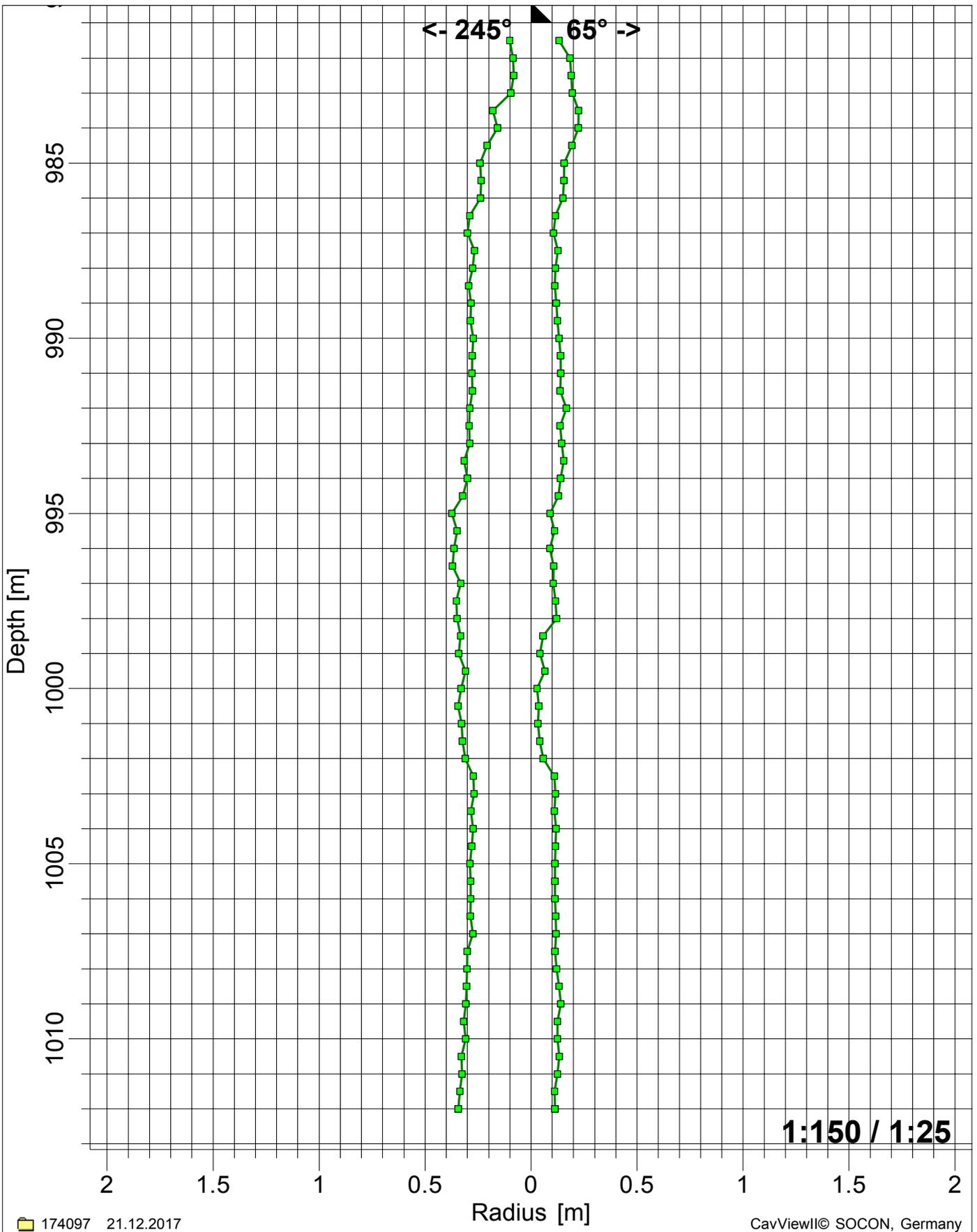


Heiligerlee K **21.12.2017**



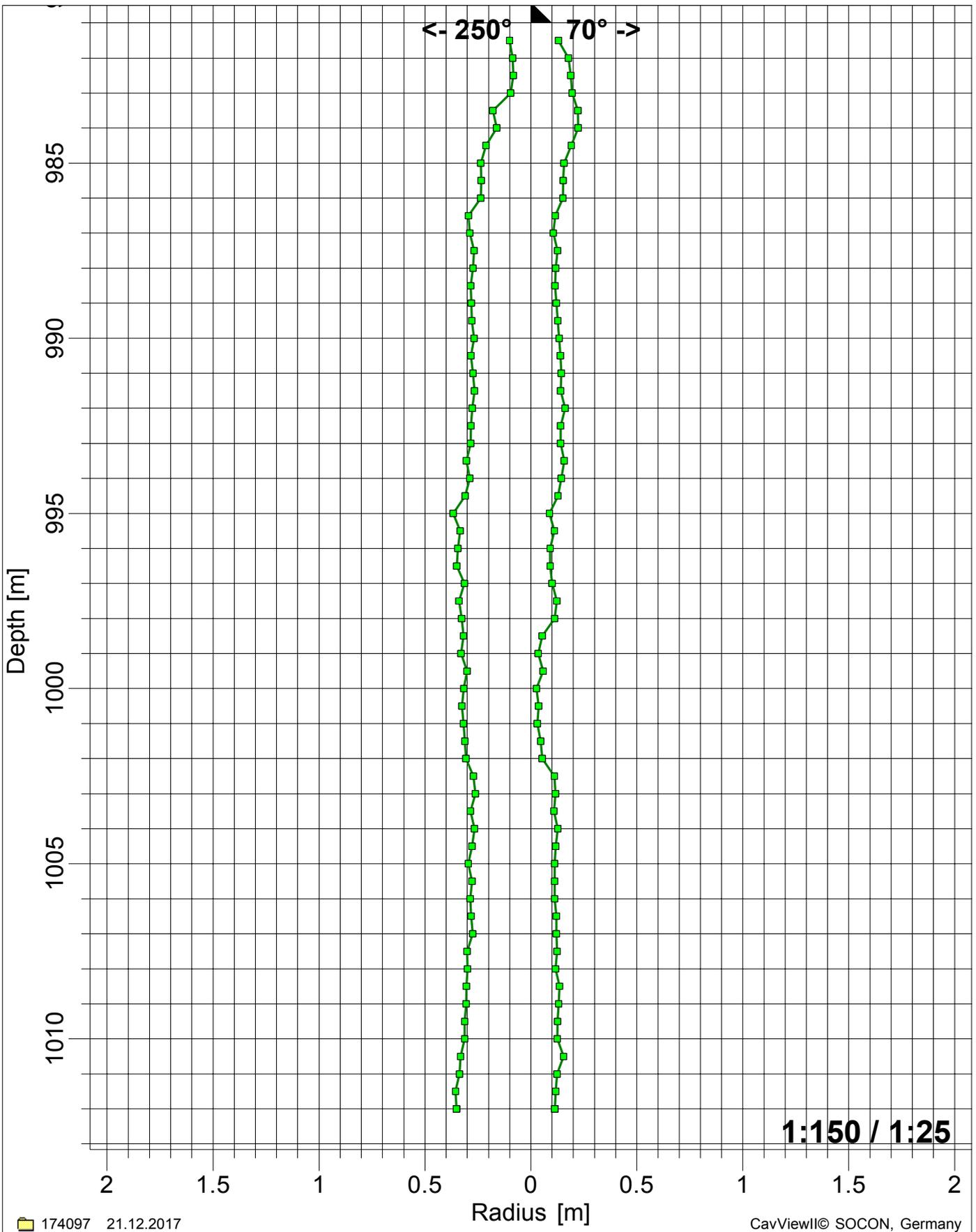
Heiligerlee K

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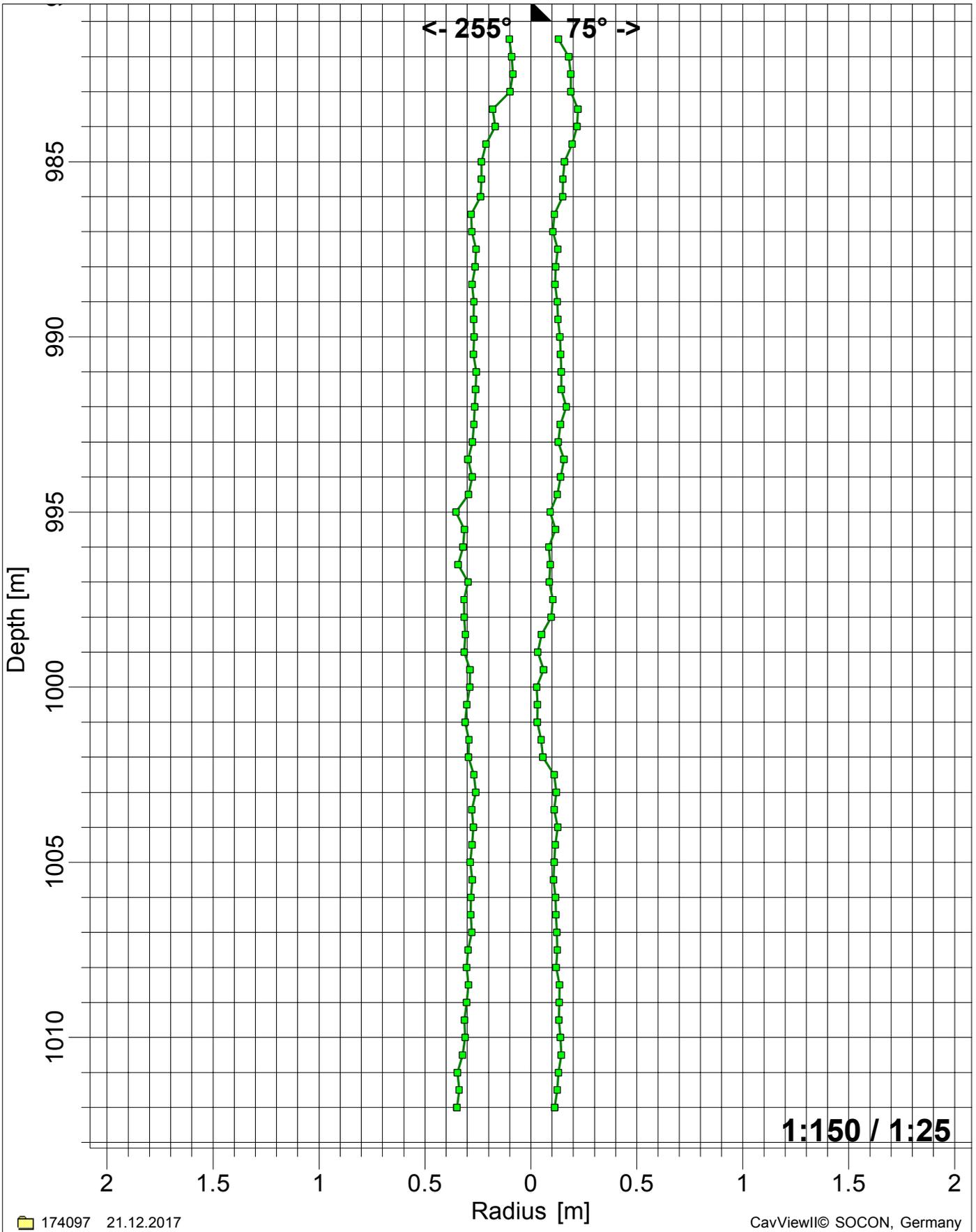


Heiligerlee K

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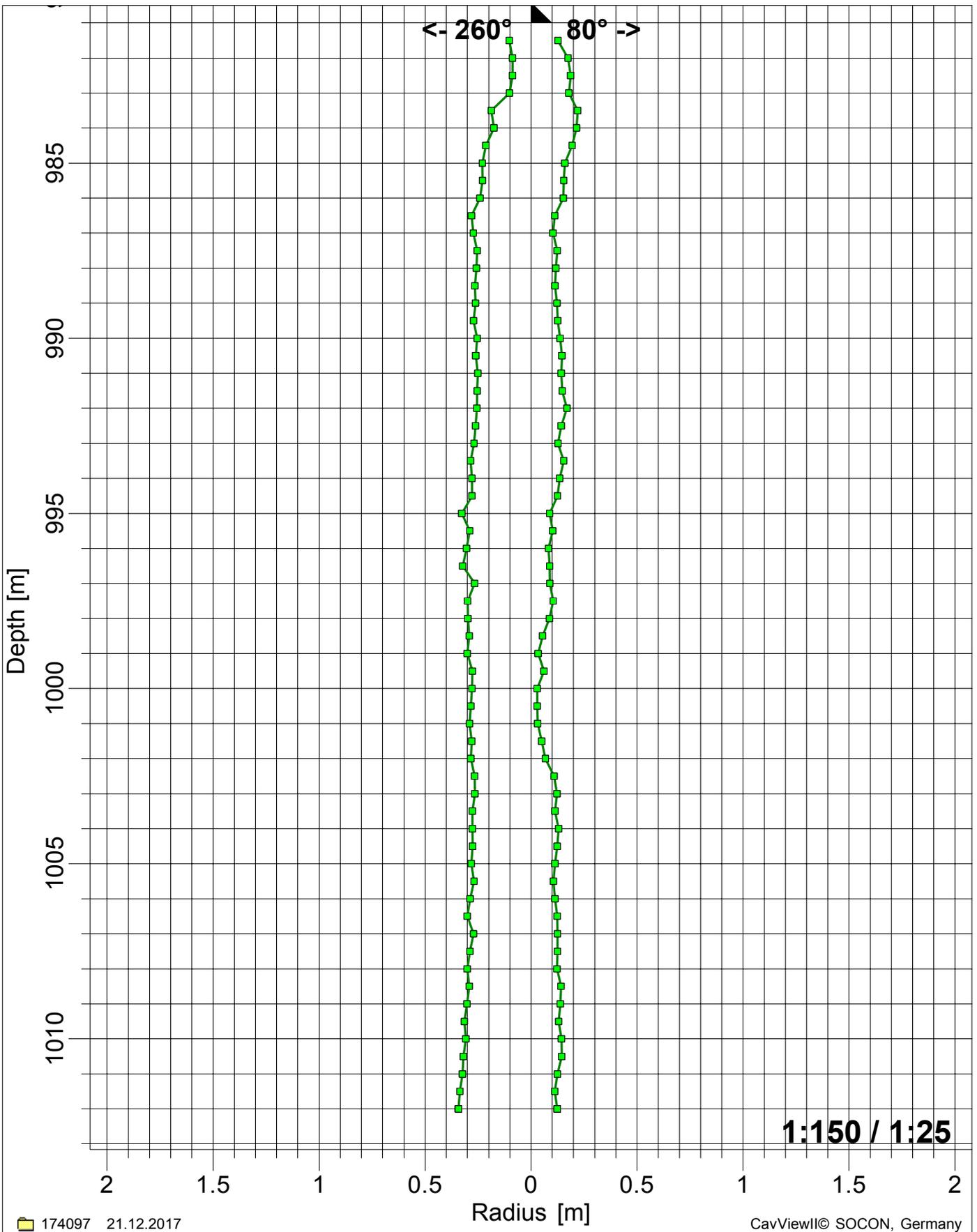


Heiligerlee K **21.12.2017**



Heiligerlee K

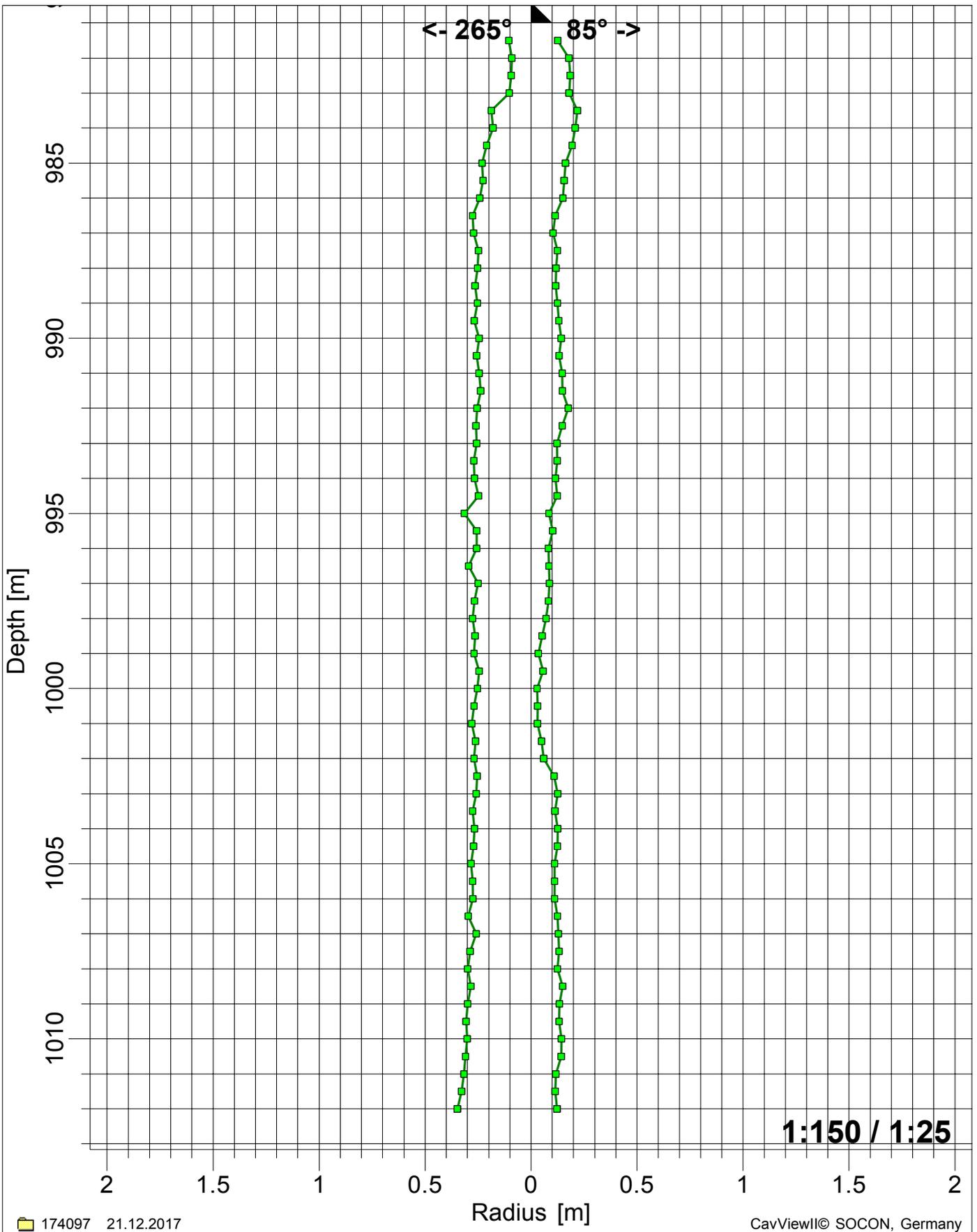
21.12.2017



 (21.12.2017)	 10 3/4" : 981.0 m
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Heiligerlee K

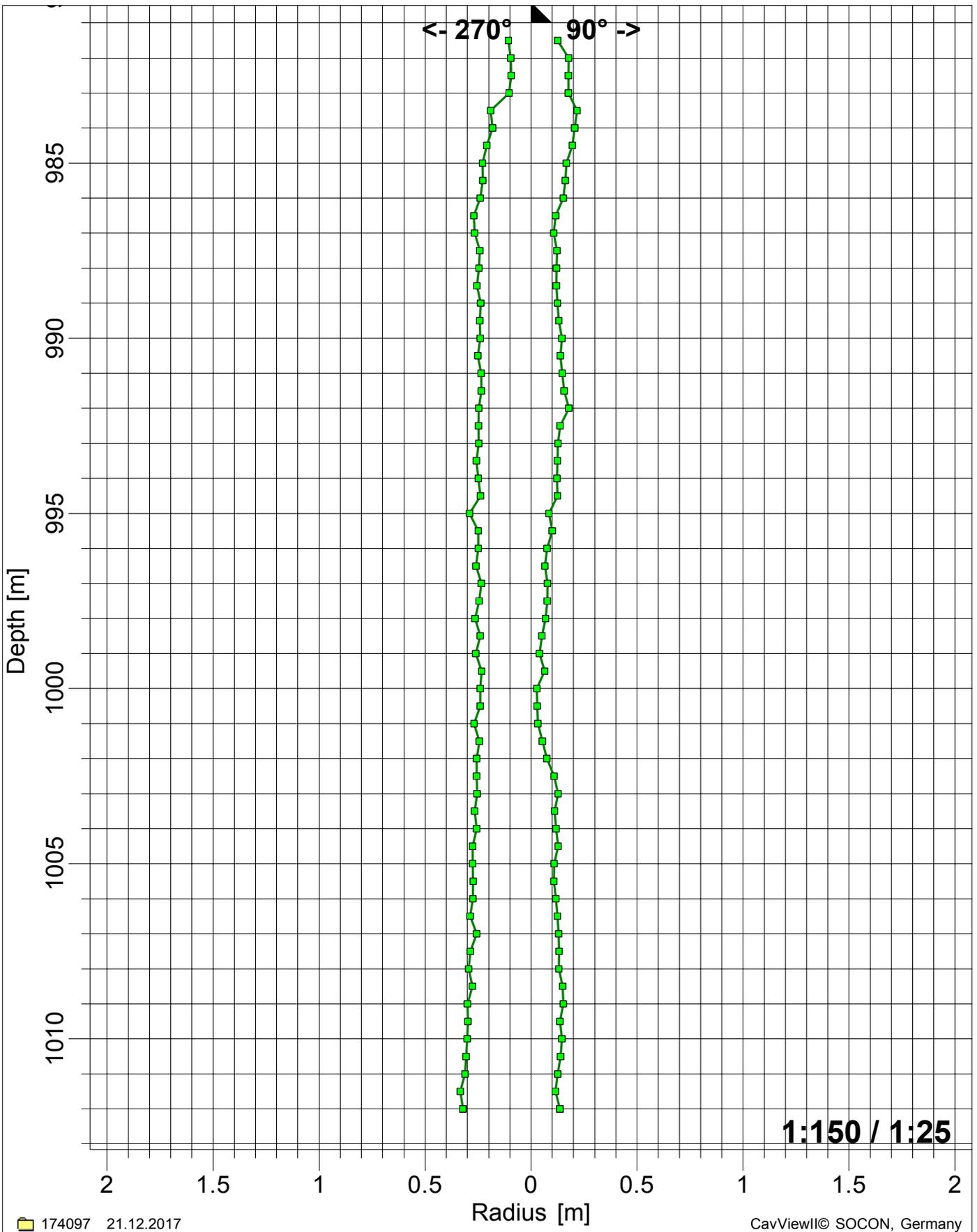
21.12.2017



 (21.12.2017)	 10 3/4" : 981.0 m
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Heiligerlee K

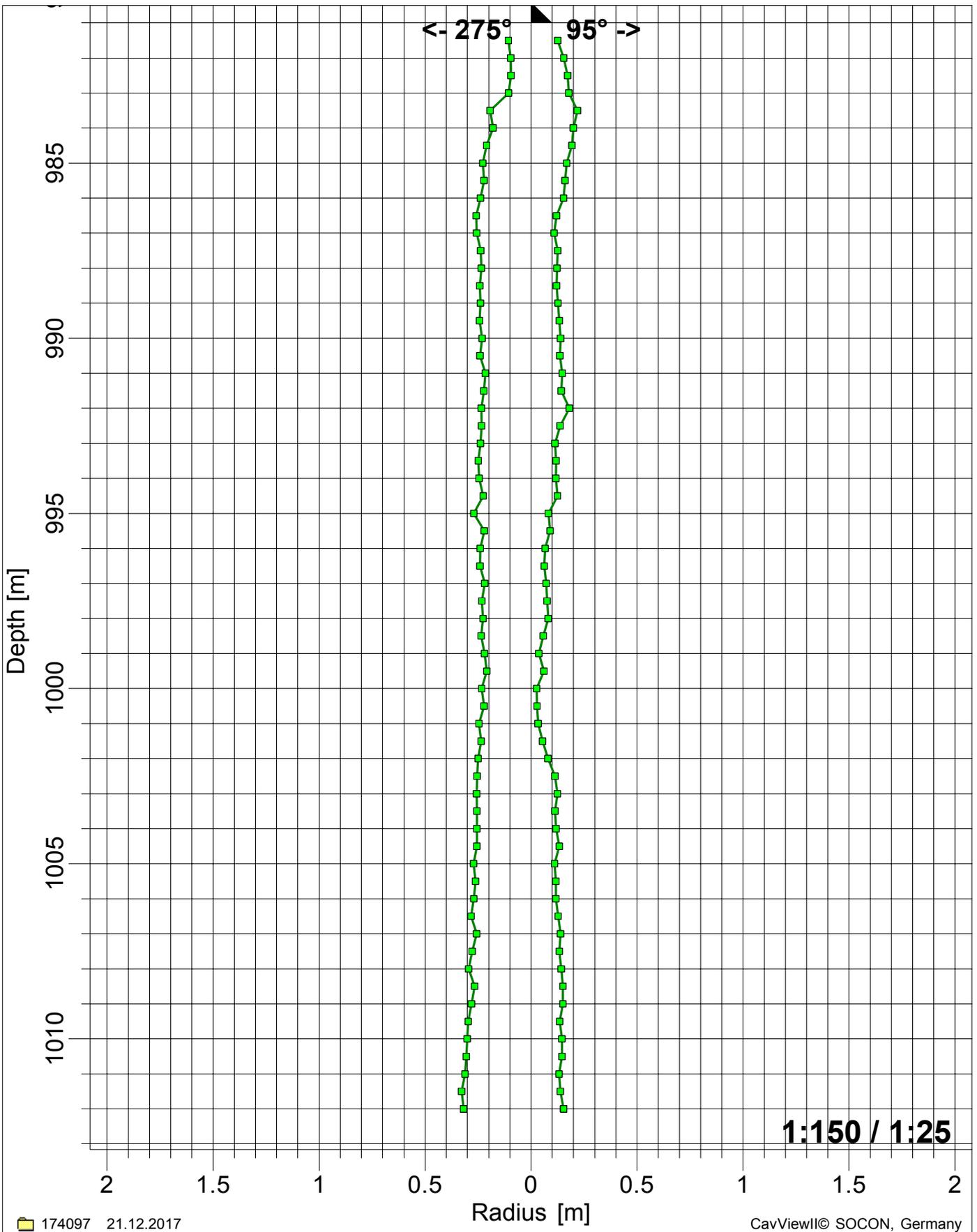
21.12.2017



 (21.12.2017)	 10 3/4" : 981.0 m
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Heiligerlee K

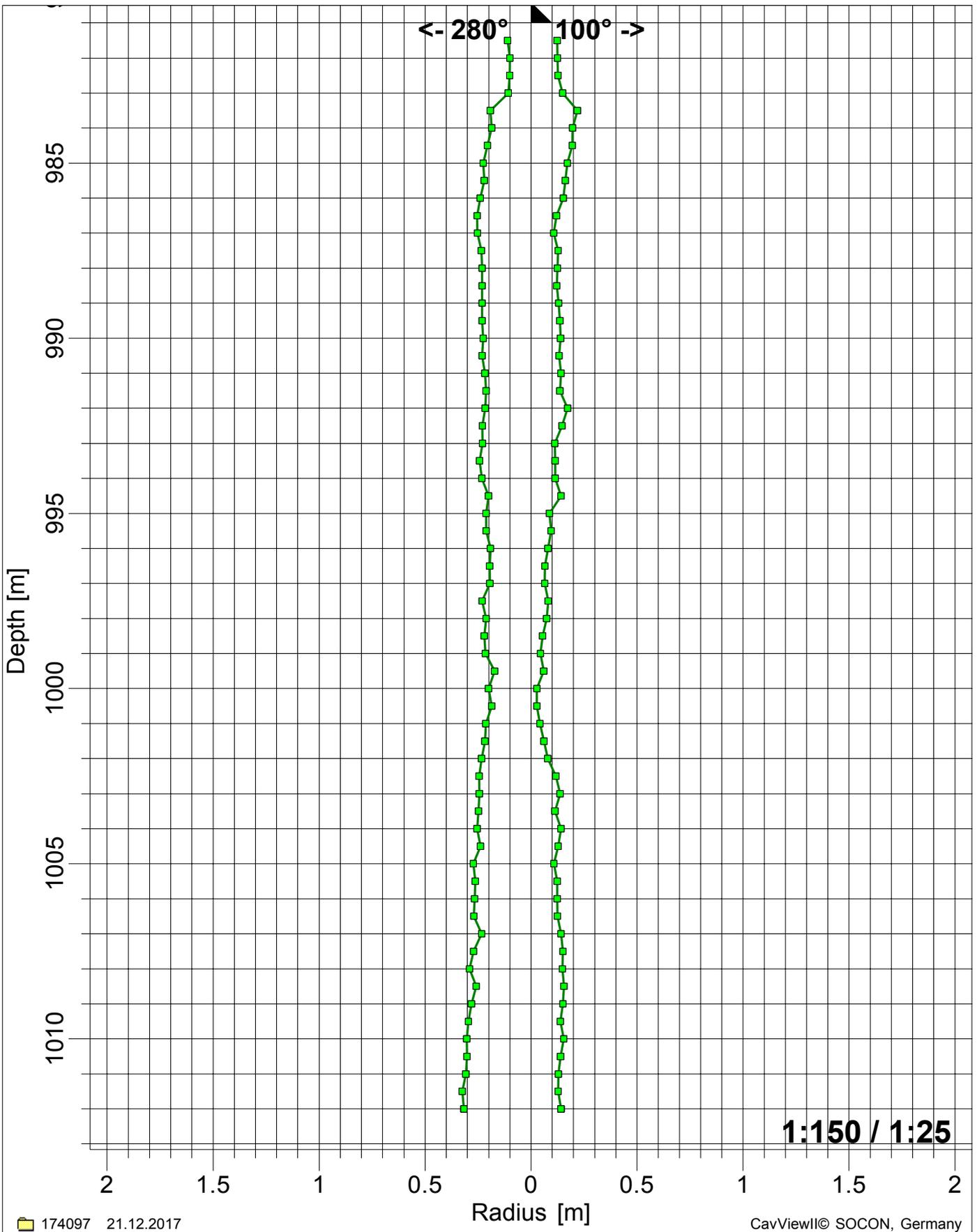
21.12.2017



 (21.12.2017)	 10 3/4" : 981.0 m
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Heiligerlee K

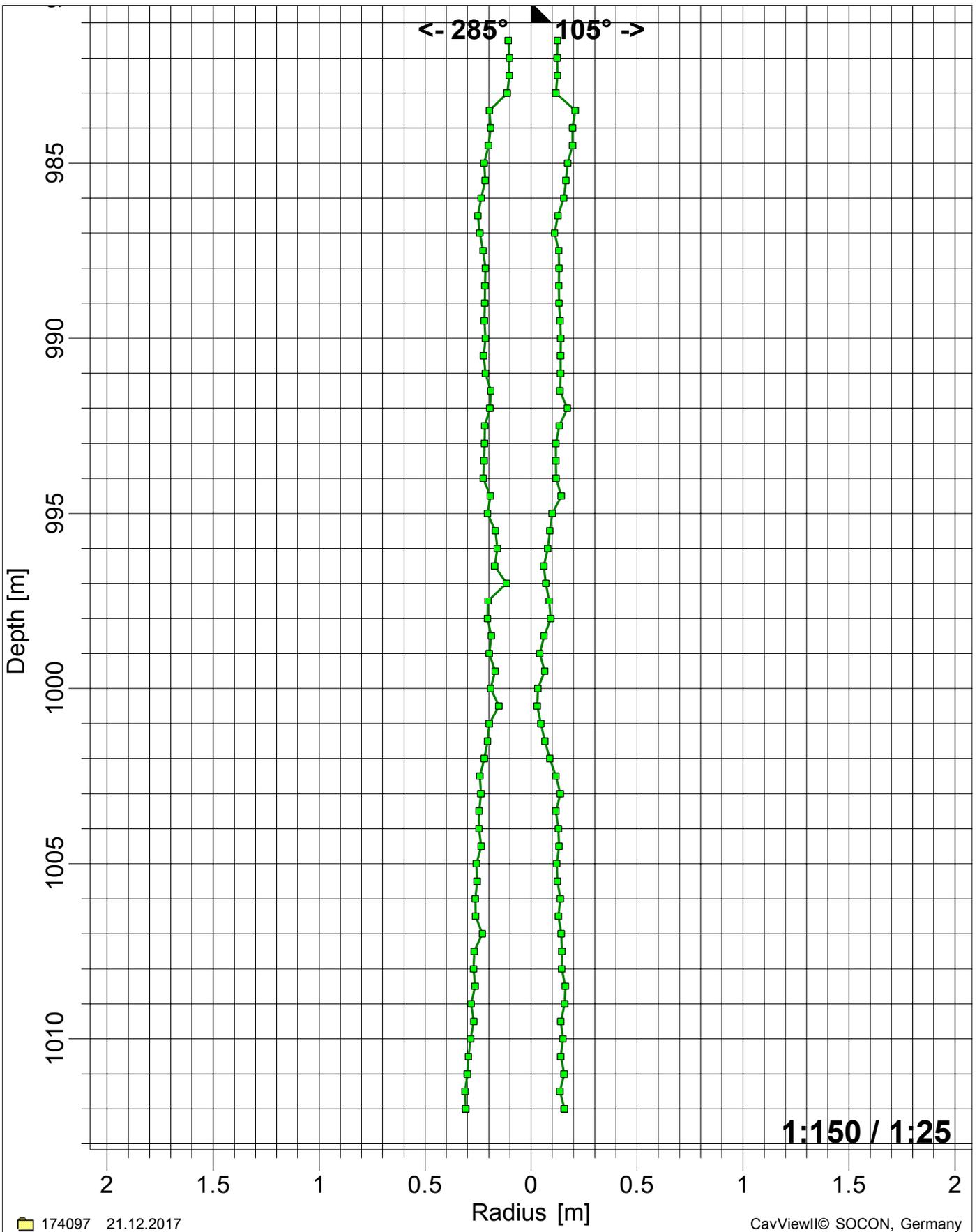
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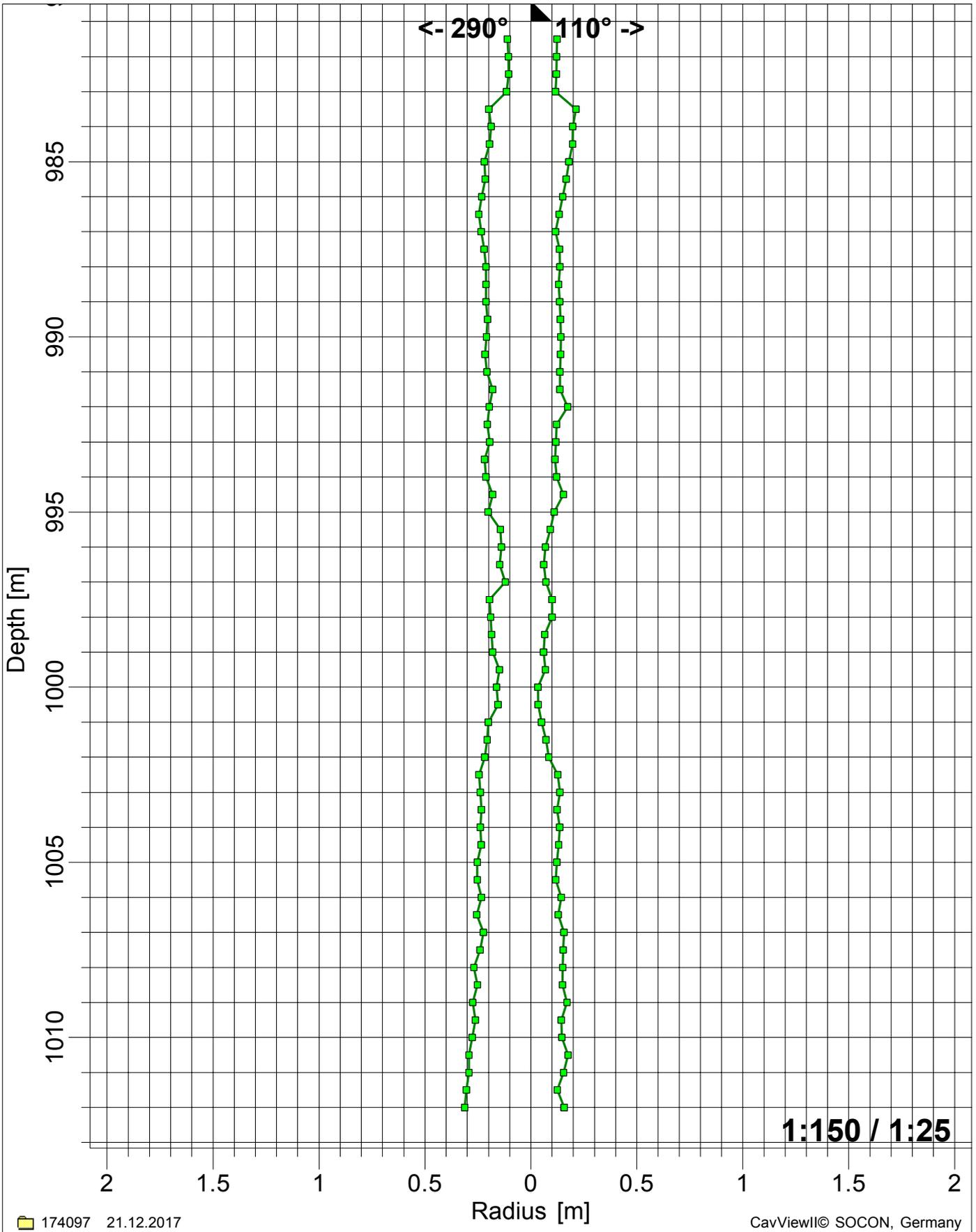
 (21.12.2017)	 10 3/4" : 981.0 m
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Heiligerlee K

21.12.2017



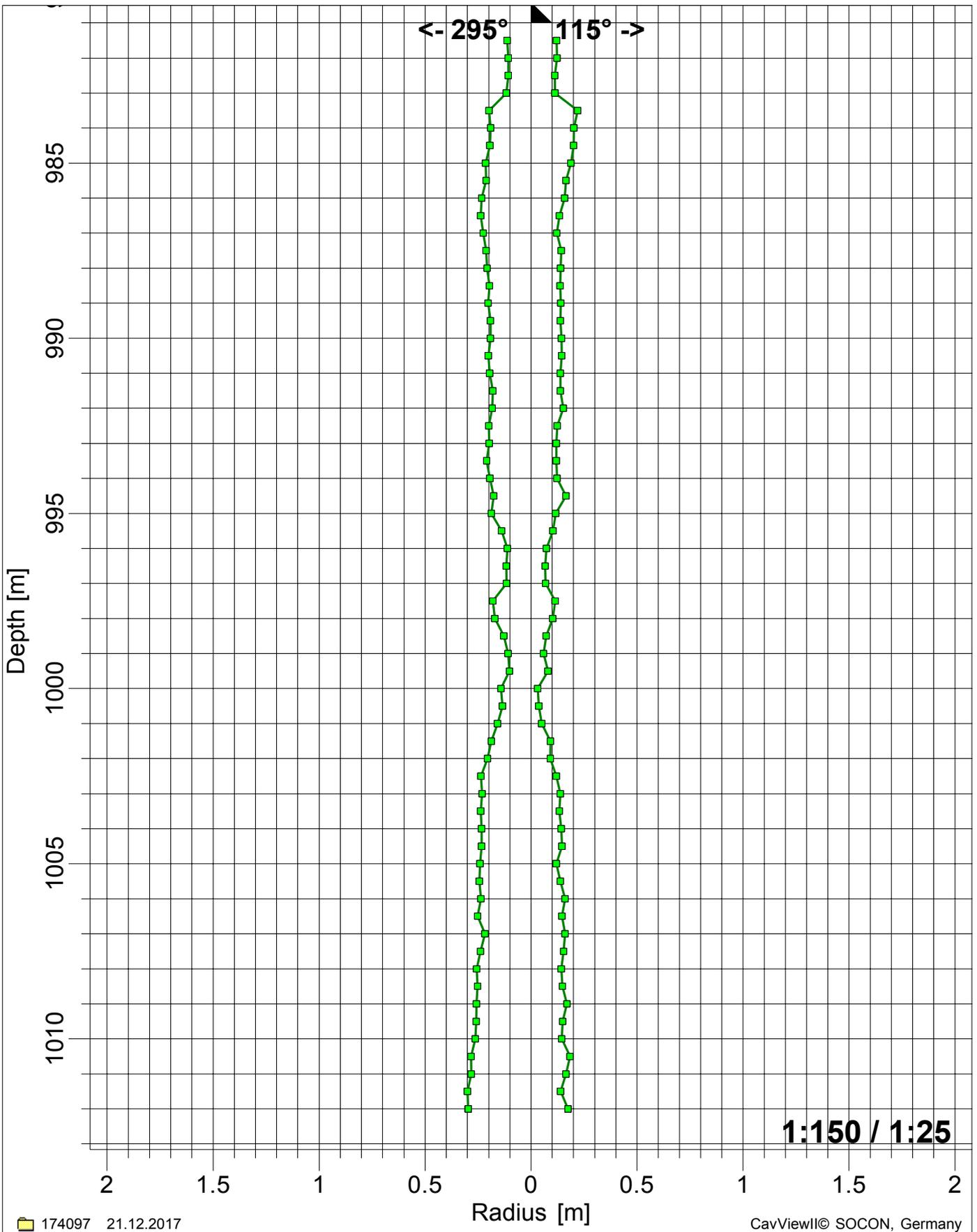
Heiligerlee K **21.12.2017**



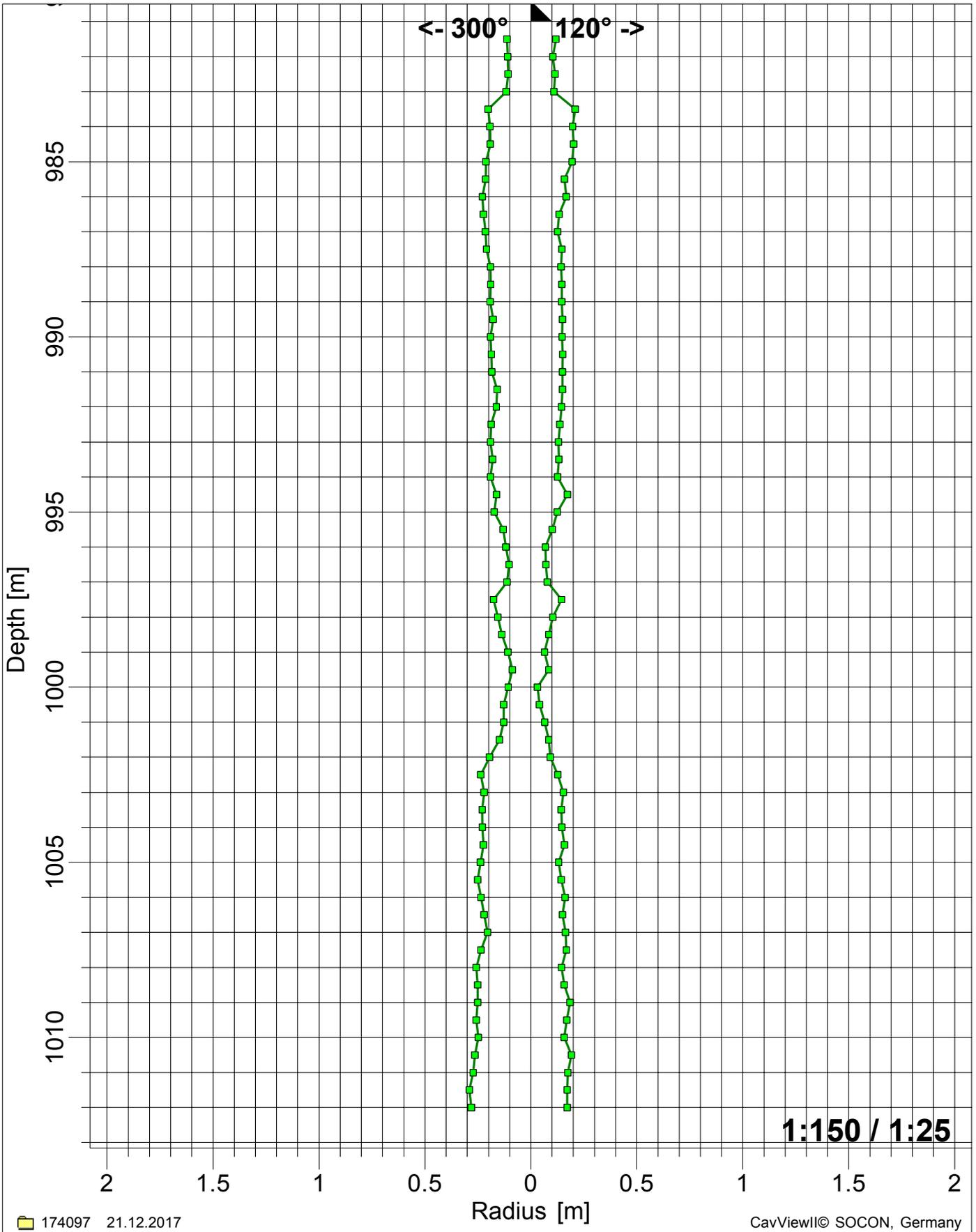
 (21.12.2017)	 10 3/4" : 981.0 m
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Heiligerlee K

21.12.2017

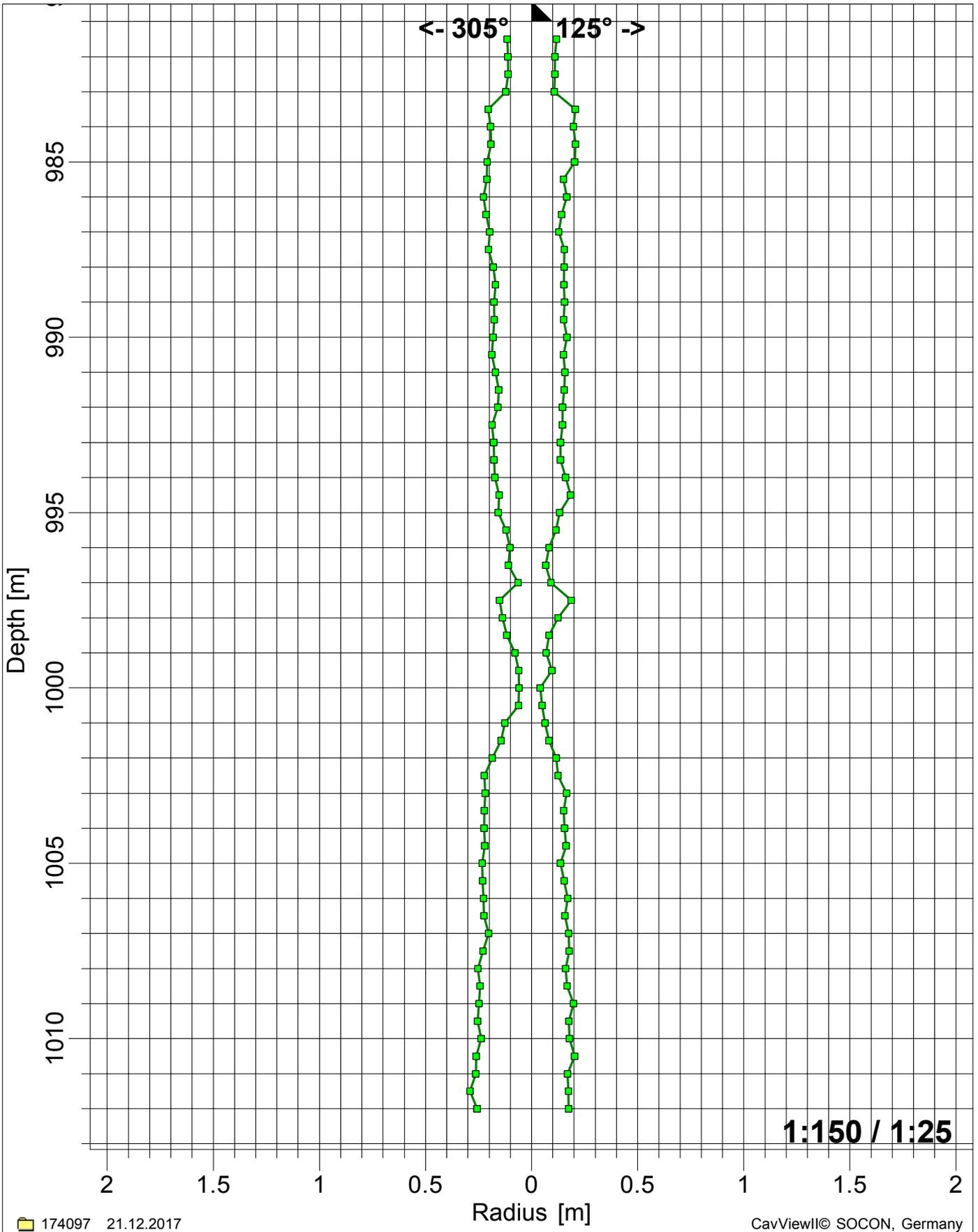


Heiligerlee K **21.12.2017**



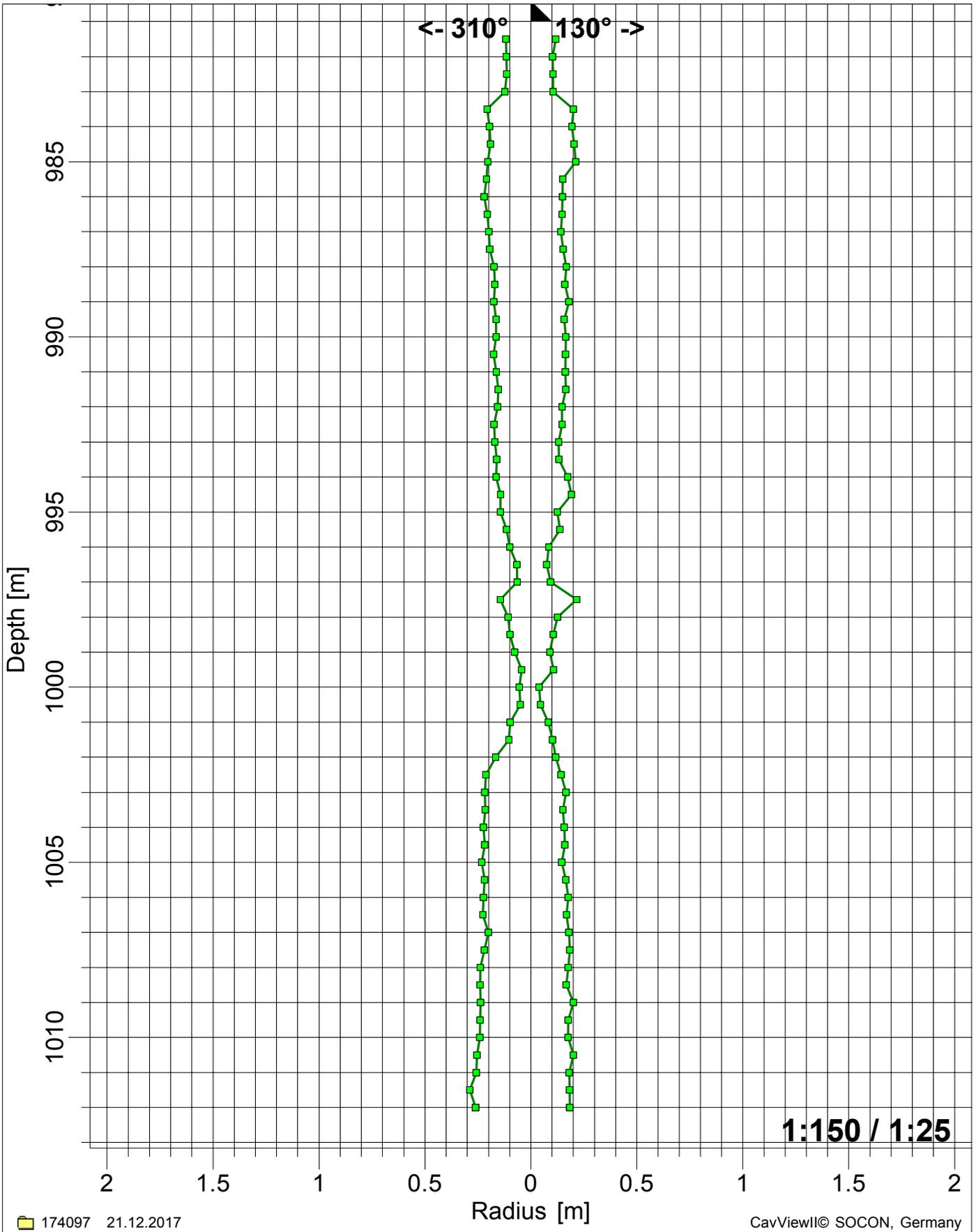
Heiligerlee K

21.12.2017



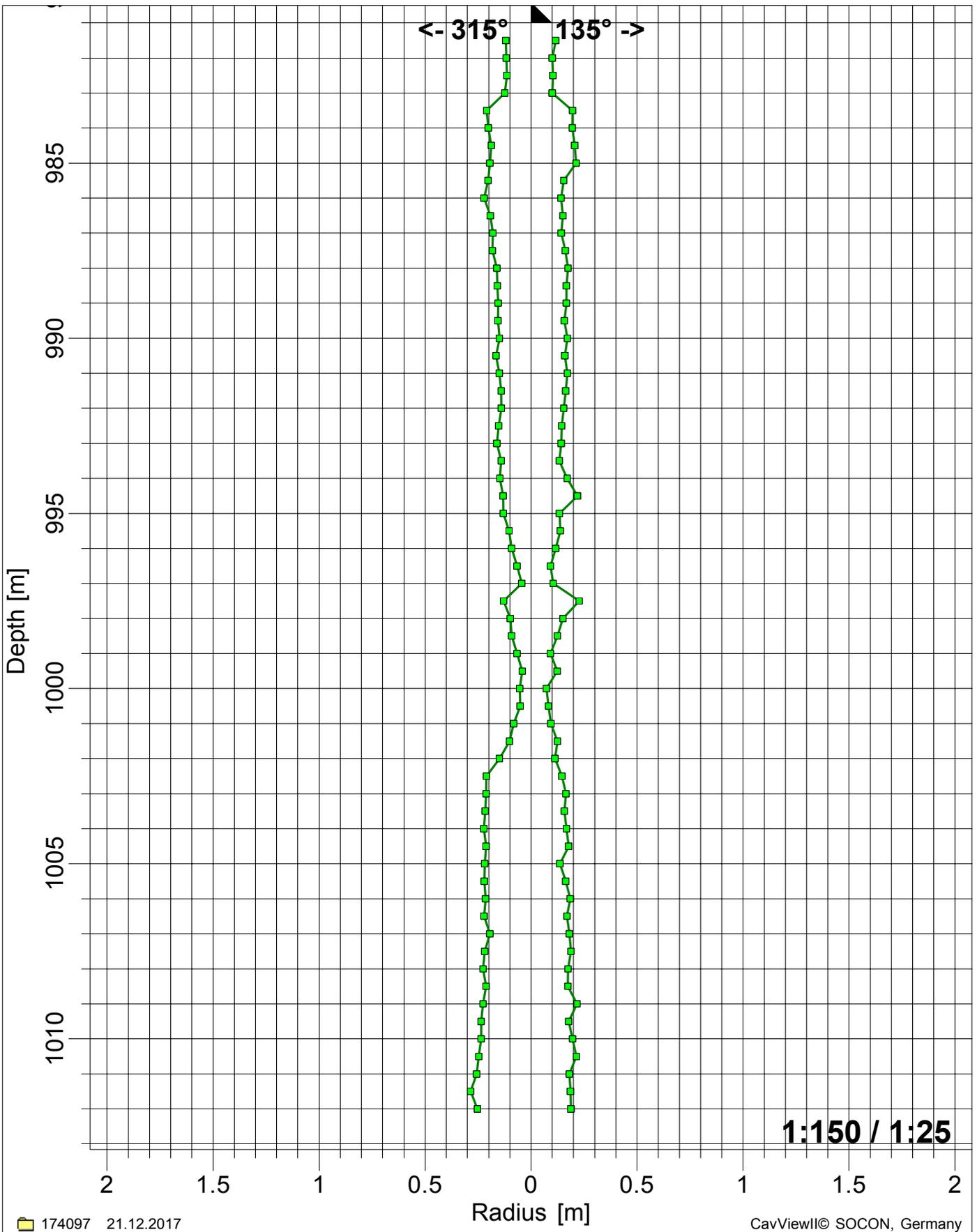
 (21.12.2017)	 10 3/4" : 981.0 m
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Heiligerlee K **21.12.2017**



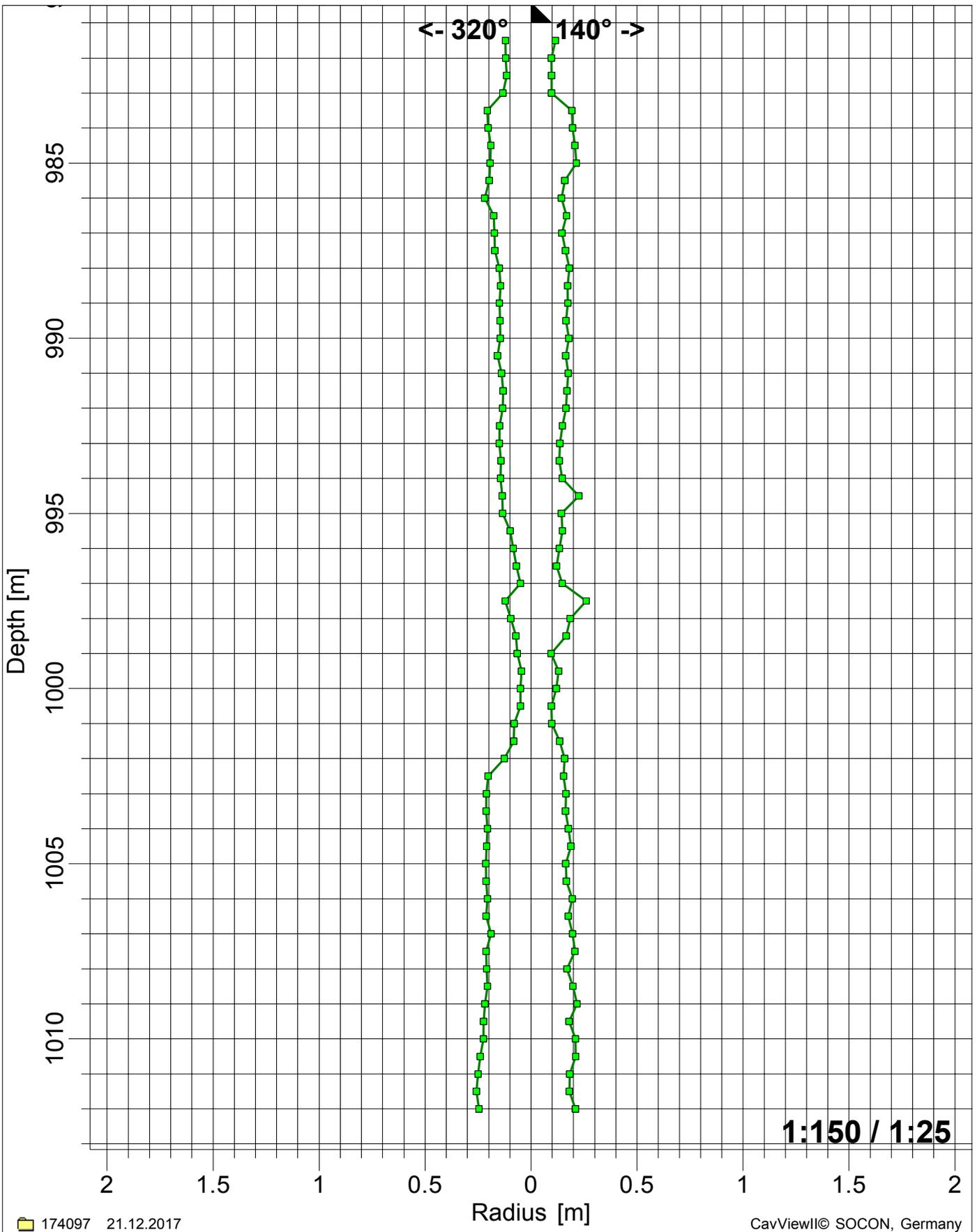
Heiligerlee K

21.12.2017

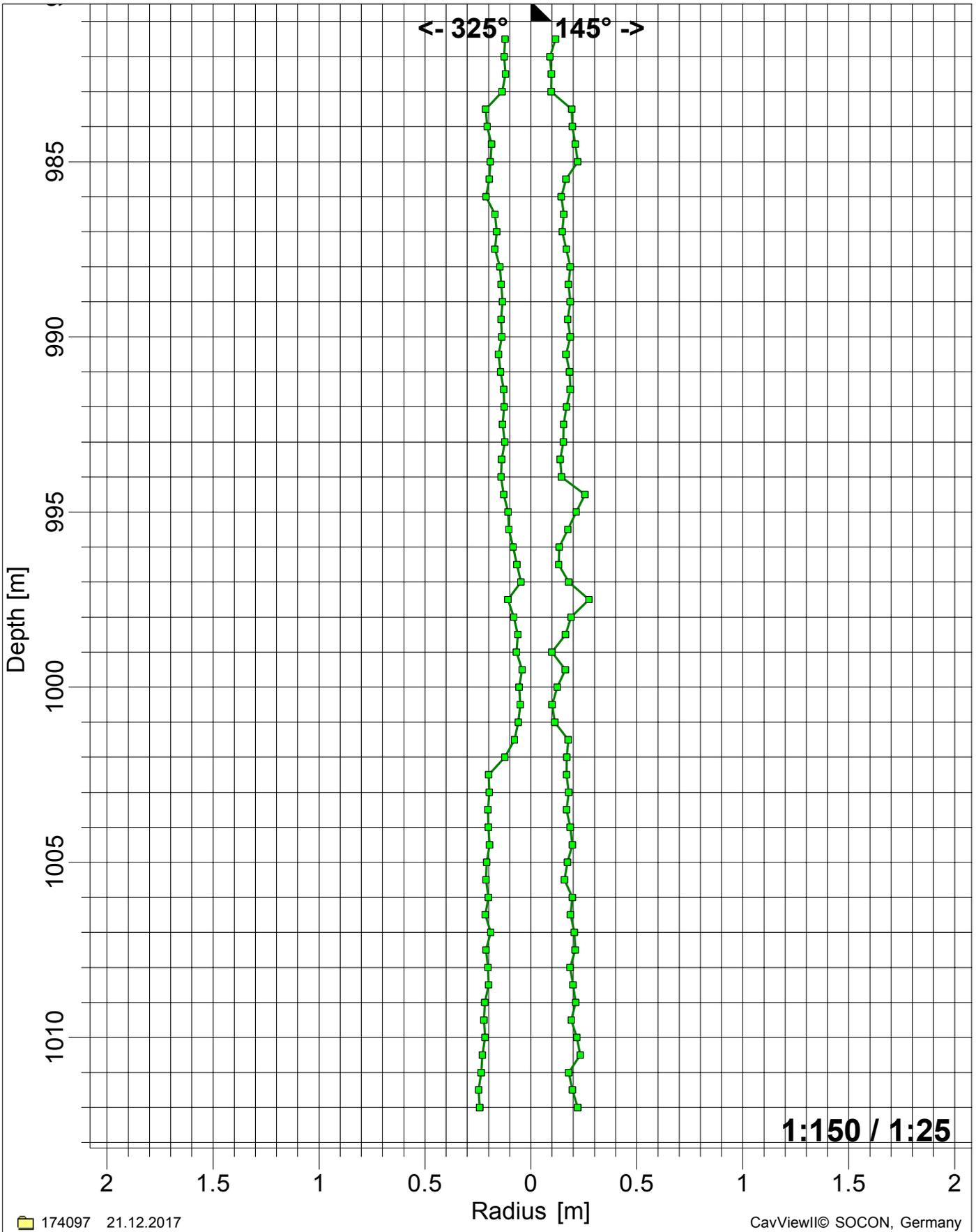


Heiligerlee K

21.12.2017

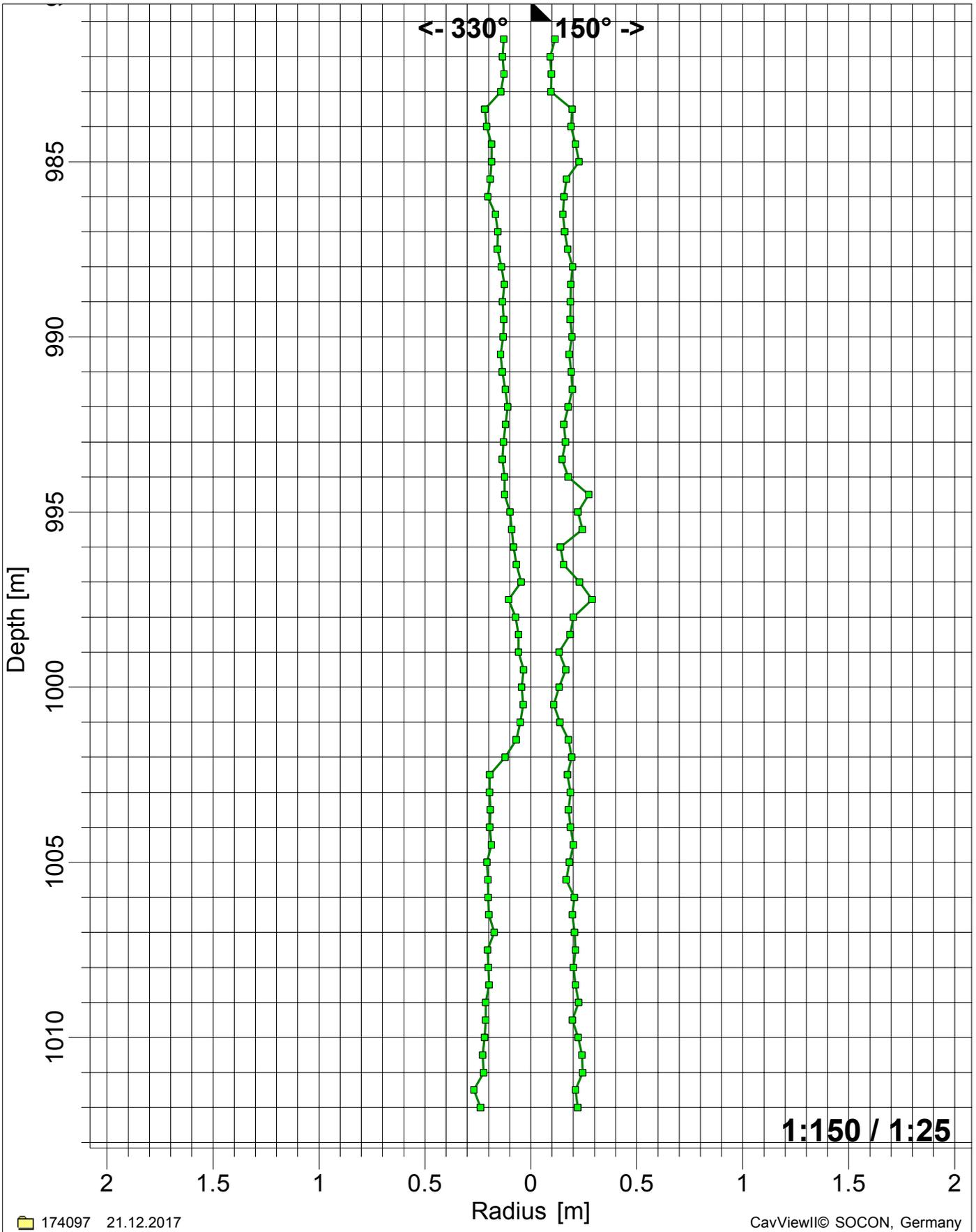


Heiligerlee K **21.12.2017**

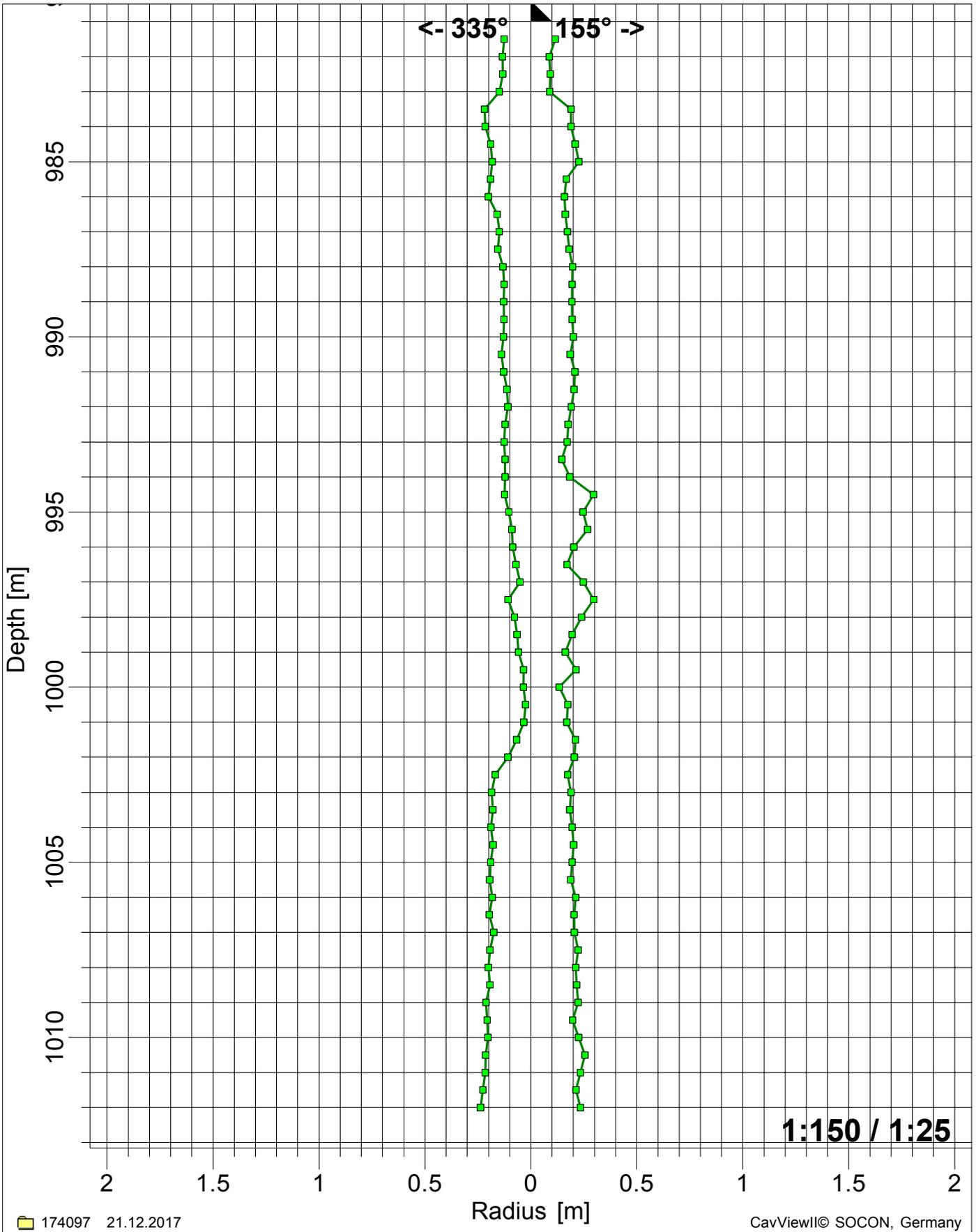


 (21.12.2017)	 10 3/4" : 981.0 m
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Heiligerlee K **21.12.2017**



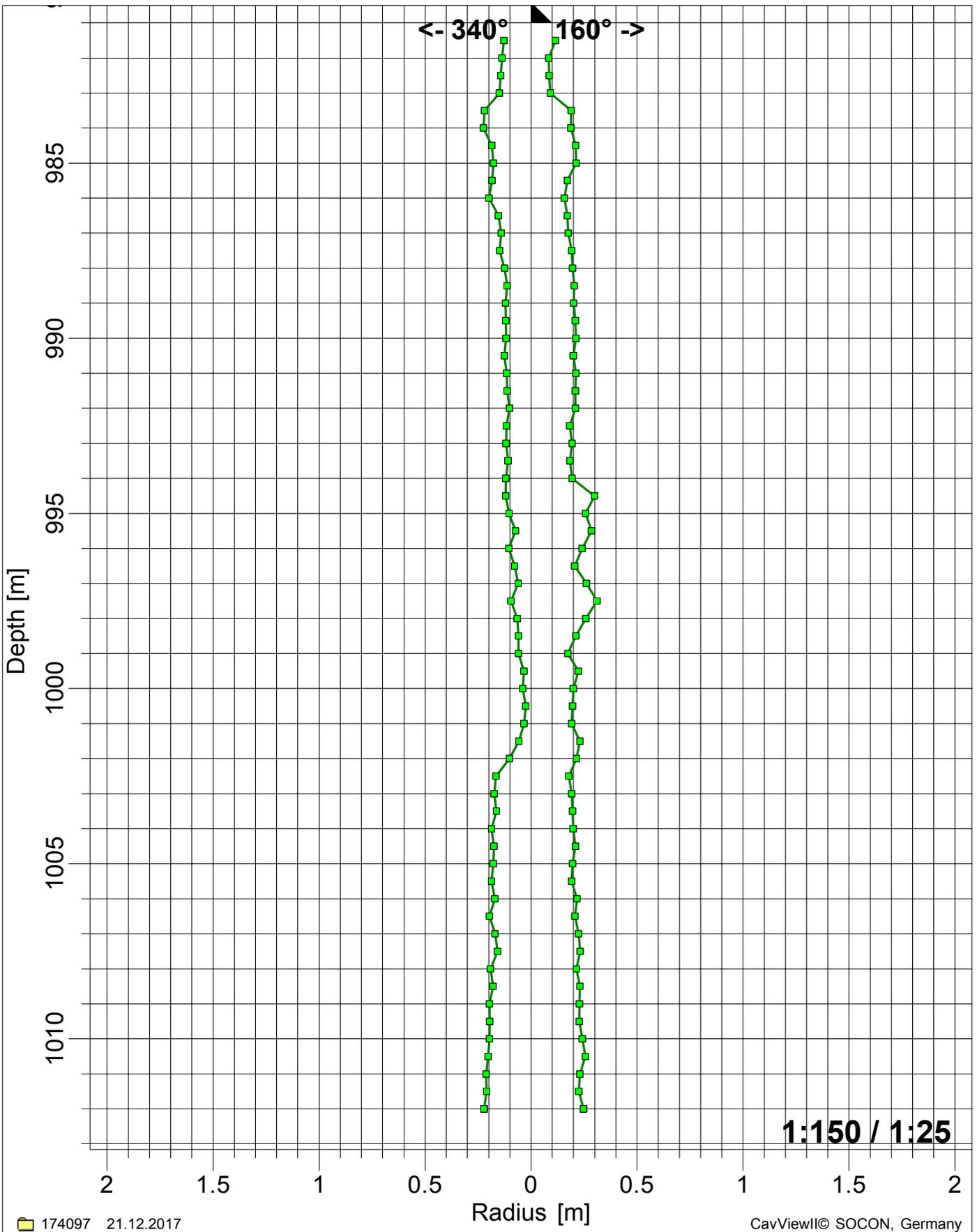
Heiligerlee K **21.12.2017**



 (21.12.2017)	 10 3/4" : 981.0 m
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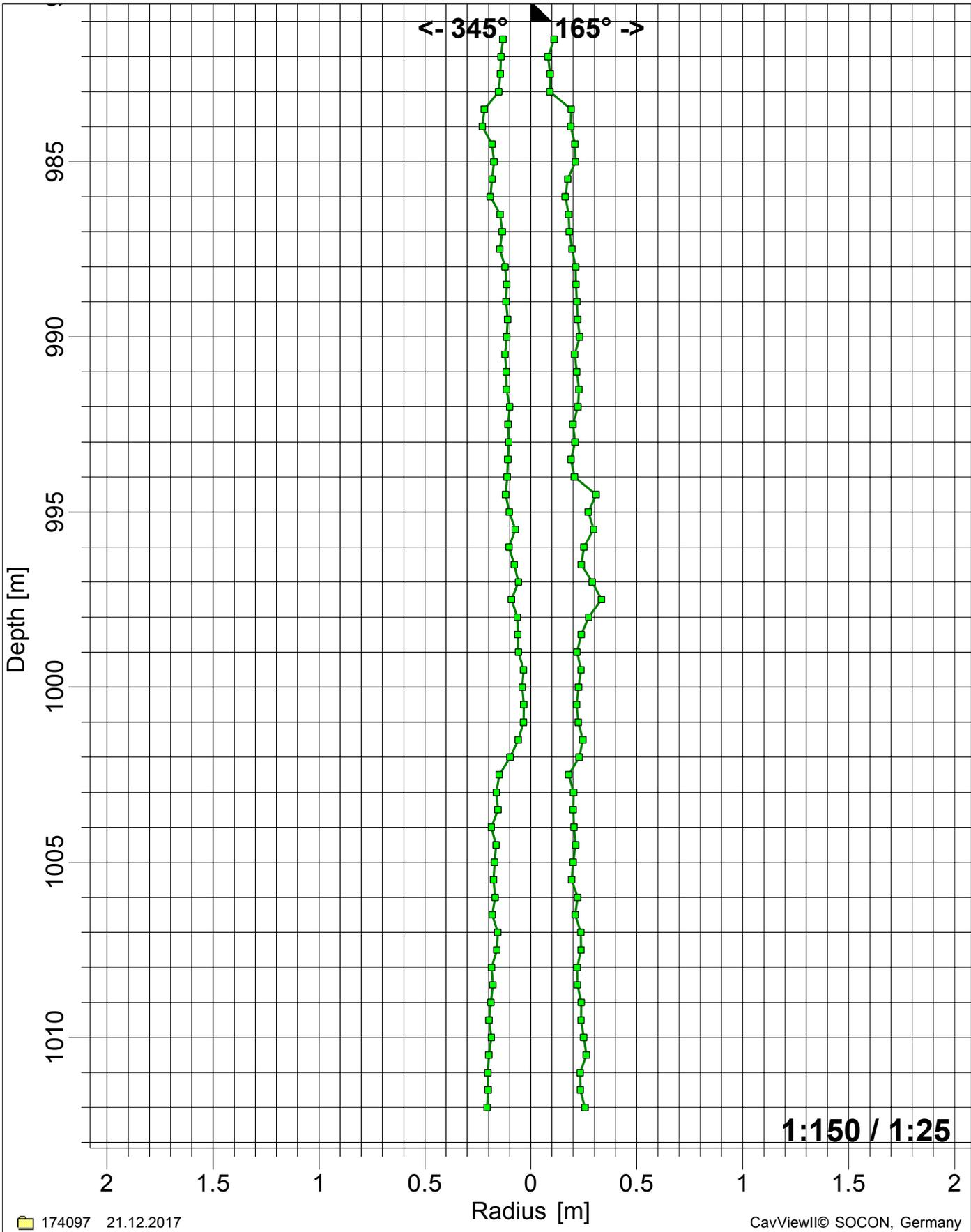
Heiligerlee K

21.12.2017



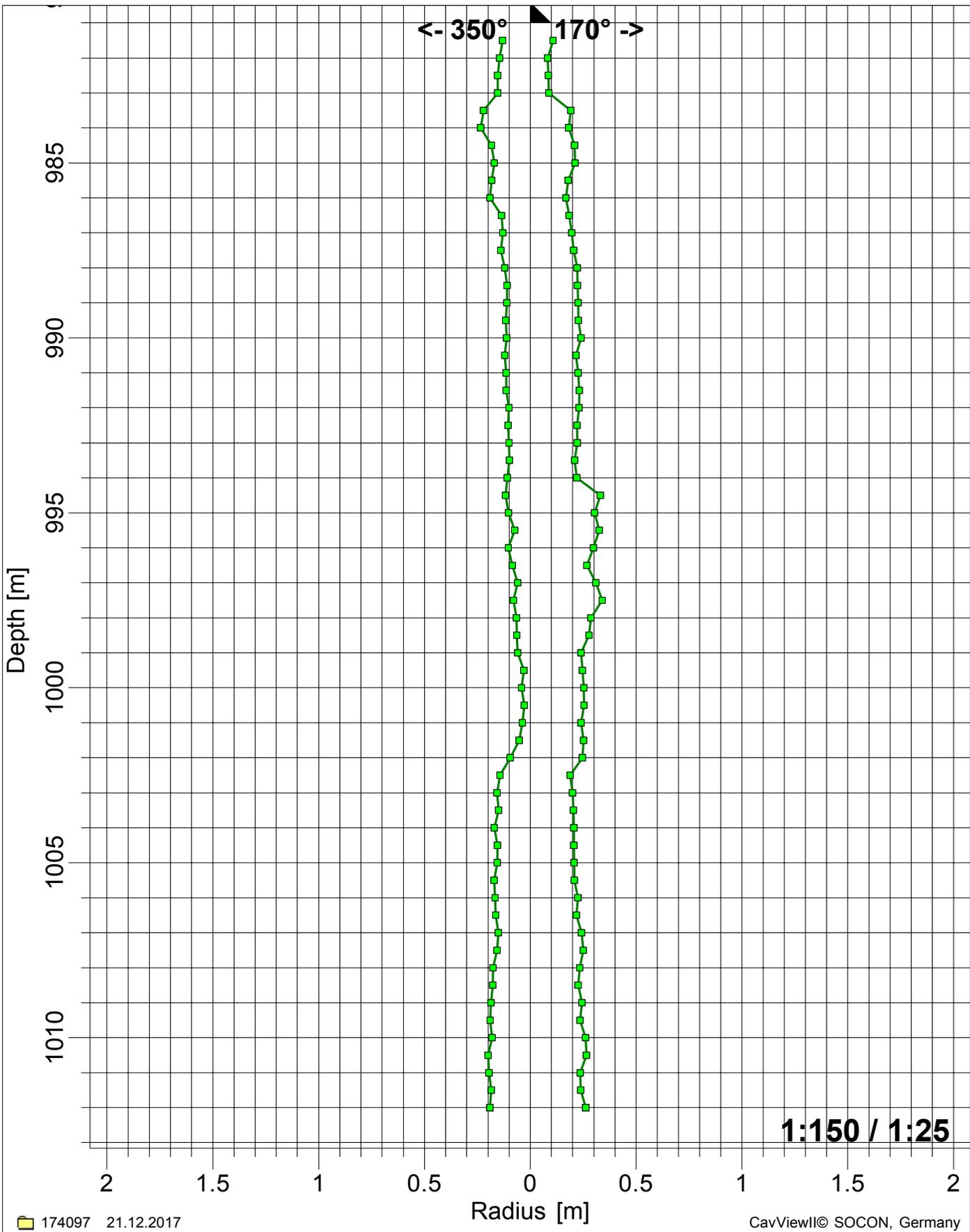
 (21.12.2017)	 10 3/4" : 981.0 m
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Heiligerlee K **21.12.2017**



—■— (21.12.2017)	▲ 10 3/4" : 981.0 m
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Heiligerlee K **21.12.2017**



 (21.12.2017)	 10 3/4" : 981.0 m
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Heiligerlee K **21.12.2017**

