Supporting Information for Automated Identification and Quantification of Microfibers and Microplastics

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Figures:

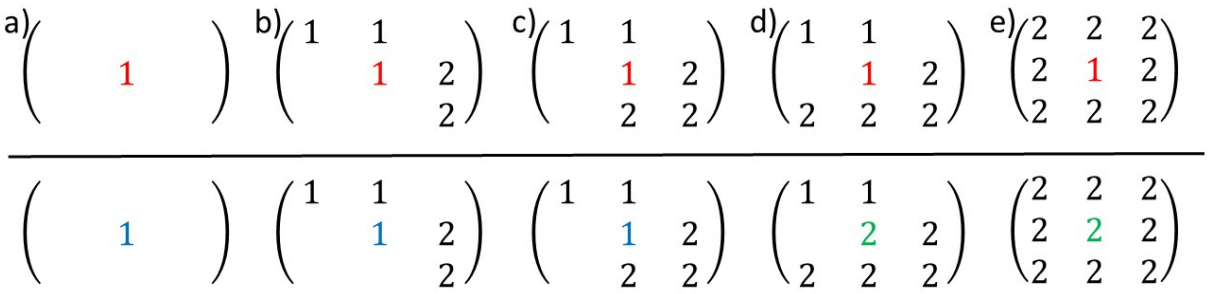
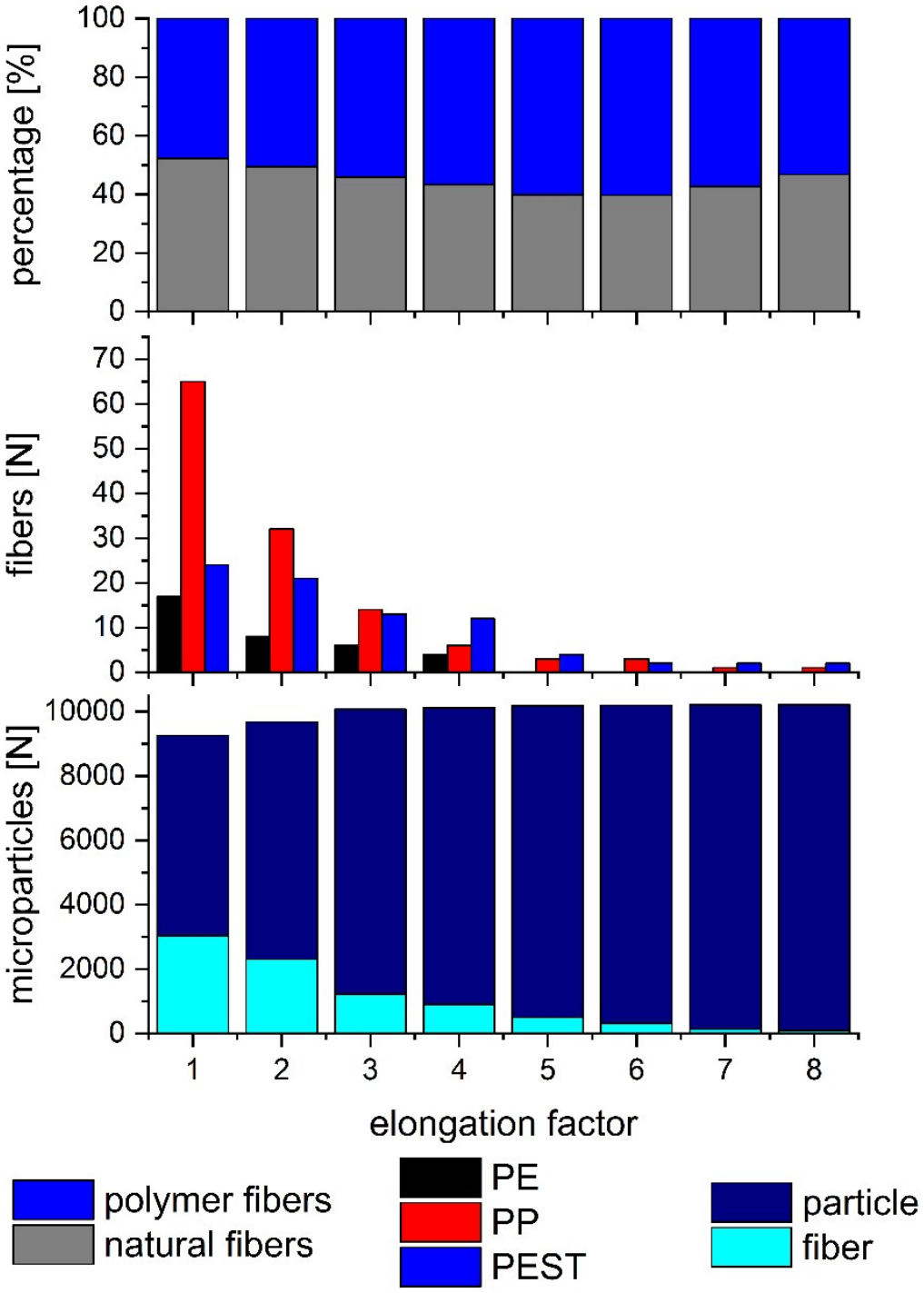


Figure S1: Examples for the polymer dependent majority voting (PDMV) filter with the situation prior (upper row) and after the application (lower row) for a) single pixel; b) equal number of polymer types excluding the target pixel; c) equal number of polymer types including the target pixel; d) larger number of pixels with different assignment; e) single pixel in area with different assignment.



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19 **Figure S2**: Influence of the parameter elongation threshold factor (ETF) on a) the percentage of
20 natural and synthetic fibers, b) the number of polyethylene (PE), polypropylene (PP) and polyester
21 (PEST) fibers and c) the number of particles and fibers together present in the sample.

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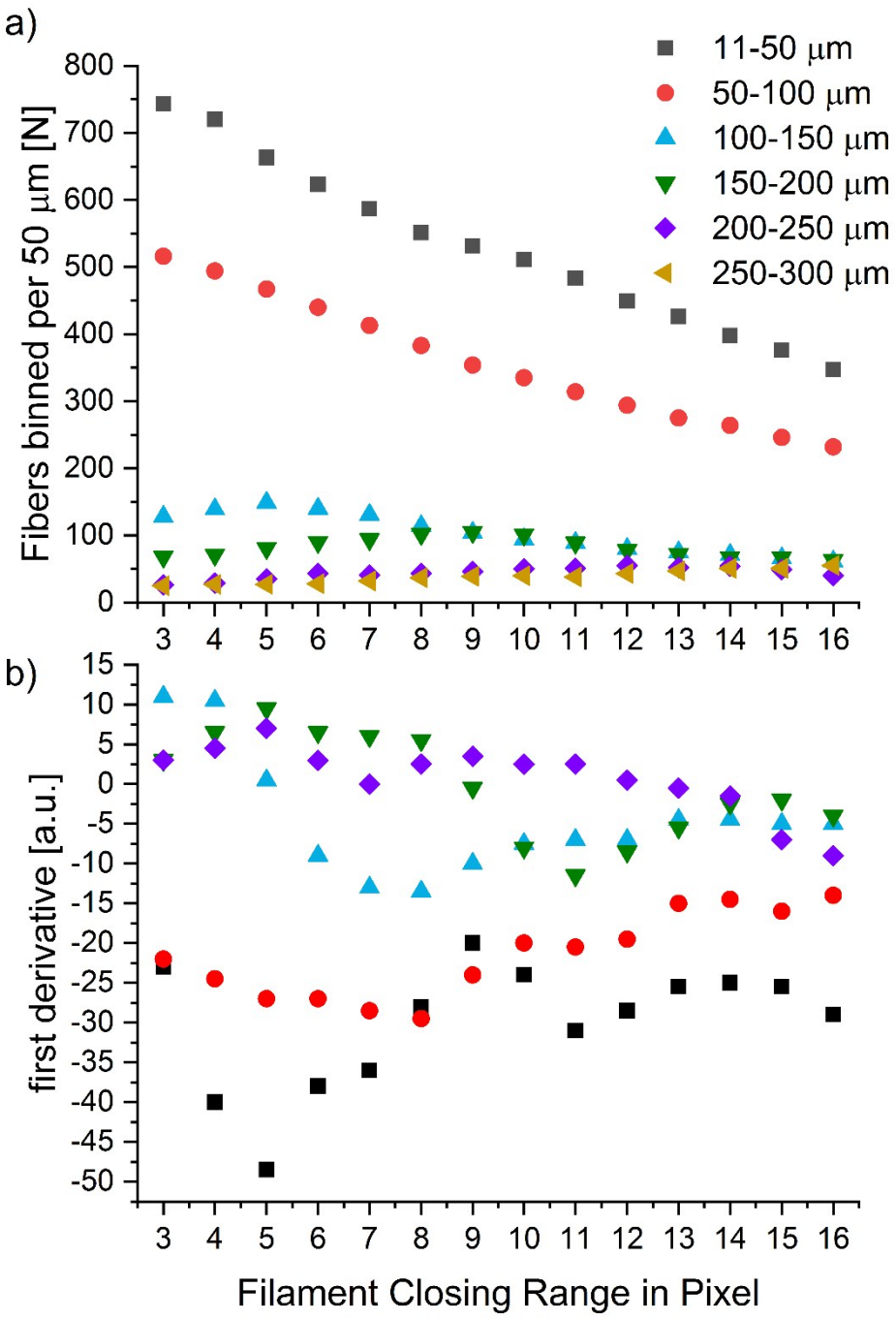
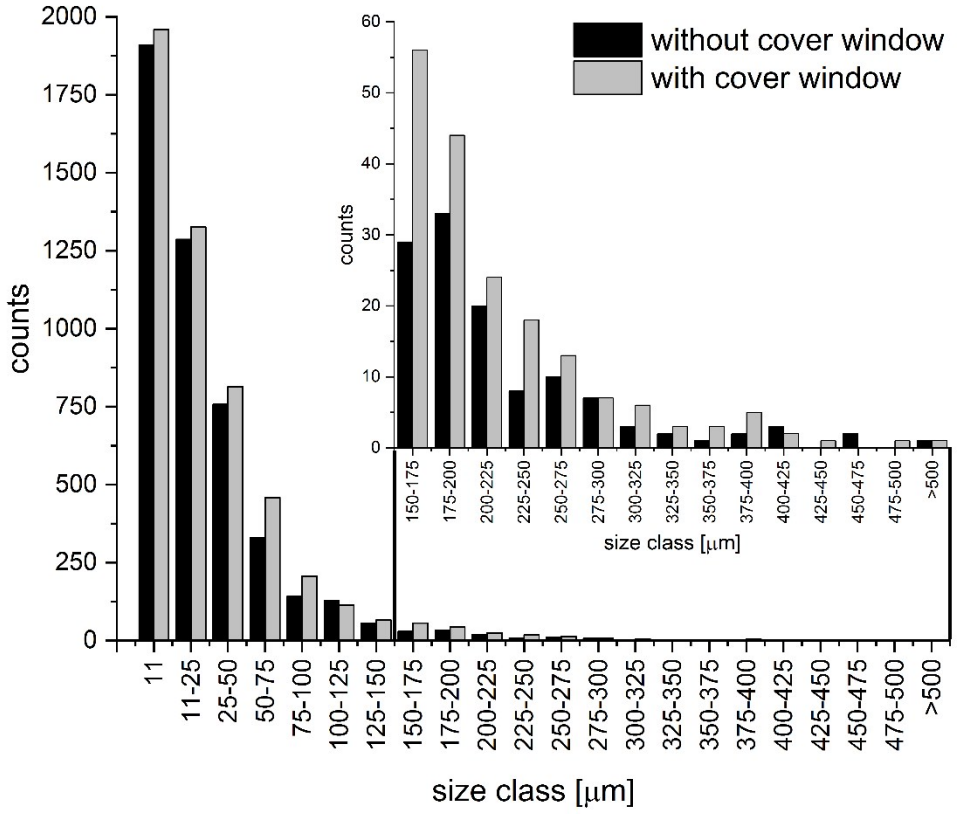


Figure S3: Influence of the filament closing range on different length classes for fibers: a) Data derived directly from the fiber analysis pipeline and b) the first derivative of the length bins from 11 to 250 µm.



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29 **Figure S4**: Number of particles derived for the sample Oldenburg before the post filtration unit taken
30 the 17th august 2015 without (black) and with cover window (grey) applied.

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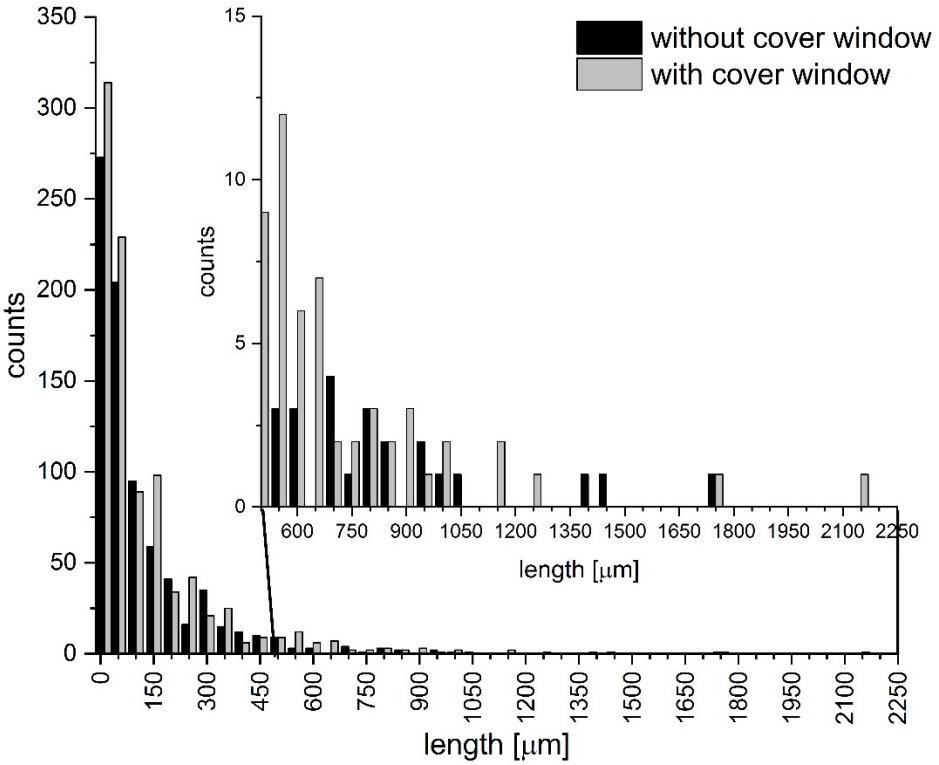

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33 **Figure S5**: Number of fibers derived for the sample Oldenburg before the post filtration unit taken
34 the 17th august 2015 without (black) and with cover window (grey) applied.

Tables

Table S1: Sample overview for the investigated waste water treatment plants Oldenburg (210000 population equivalent) and Holdorf (26000 population equivalent), sample volume and portion of the sample concentrated onto the Anodisc with data from Mintenig et al. 2017[1] and Primpke et al. 2017[2]

Sample	Waste water treatments	Influx composition	Sample volume [m^{-3}]	Portion analyzed [%]
Holdorf_1308	Primary and Secondary	40 % dairy, municipal/ industrial	0.500	10.2
Holdorf_1708	Primary and Secondary	40 % dairy, municipal/ industrial	0.500	12.1
Oldenburg_1308_vF	Primary and Secondary prior to filtration unit	municipal/ industrial	0.501	42.6
Oldenburg_1308_nF	Past final filtration unit	municipal/ industrial	0.531	12.2
Oldenburg_1708_vF	Primary and Secondary prior to filtration unit	municipal/ industrial	0.185	40.4
Oldenburg_1708_nF	Past final filtration unit	municipal/ industrial	0.500	59.8

Table S2: Overview on the numbers of particles and fibers found to be synthetic (polyethylene, polyethylene oxidized, polyethylene-chlorinated, polypropylene, polystyrene, polycarbonate, polyamide, polyvinylchloride, cellulose chemical modified, nitrile rubber, polyester, acrylates/polyurethanes/varnish/lacquer, polysulfone, polyetheretherketon, polychloroprene, polyisoprene chlorinated, polylactide acid, ethylene-vinyl-acetate, polyimide, polyoxymethylene, polybutadiene, acrylonitrile-butadiene, rubber type 1, rubber type 2 and rubber type 3), natural (cellulose, chitin and fur/protein based) and other materials (quartz, coal and charcoal). All data shown is not blank corrected for better comparison.

Material	Type	BaF_2 cover window	Blank [N]	Holdorf_1308 [N]	Holdorf_1708 [N]	Oldenburg_1308_vF [N]	Oldenburg_1308_nF [N]	Oldenburg_1708_vF [N]	Oldenburg_1708_nF [N]
Synthetic	Fiber	no	1	97	251	83	3	450	219
Natural	Fiber	no	57	488	444	221	20	327	583
Other	Fiber	no	0	52	200	3	1	15	89
Synthetic	Particle	no	18	673	1771	594	32	3119	3291
Natural	Particle	no	185	2830	1856	1366	196	1259	4410
Other	Particle	no	1	646	1826	72	22	349	1373
Synthetic	Fiber	yes	5	25	217	153	3	359	261
Natural	Fiber	yes	117	294	657	746	68	544	515
Other	Fiber	yes	0	263	59	23	1	18	72
Synthetic	Particle	yes	34	103	1379	1242	16	2506	2334
Natural	Particle	yes	497	1422	3177	4100	534	2431	2748
Other	Particle	yes	6	1862	722	332	19	191	655

Table S3: Synthetic microlitter concentration determined via automated analysis pipeline (AAP, black) and microplastic automated fiber/particle analysis pipeline (MPAPP, blue) on the uncovered dataset and MPAPP applied to the dataset of the covered sample (red). All data shown is not blank corrected for better comparison.

Sample station	AAP	MPAPP	Cover glass + MPAPP
	N L^{-1}	N L^{-1}	N L^{-1}
Holdorf_1308	15.05	14.99	2.42
Holdorf_1708	33.51	33.39	26.31
Oldenburg_1308_vF	3.16	3.14	6.47
Oldenburg_1308_nF	0.53	0.51	0.22
Oldenburg_1708_vF	47.47	47.51	38.01
Oldenburg_1708_nF	11.79	11.70	8.60

References

1. S. M. Mintenig, I. Int-Veen, M. G. J. Löder, S. Primpke and G. Gerdts, *Water Res.*, 2017, **108**, 365-372.
2. S. Primpke, H. Imhof, S. Piehl, C. Lorenz, M. Löder, C. Laforsch and G. Gerdts, *Chem. unserer Zeit*, 2017, **51**, 402-412.