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PUFF-BY-PUFF ANALYSIS OF MAINSTREAM SMOKE CONSTITUENTS OF NON-LIP AND LIP CIGARETTES (2)

ST 48

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CORESTA Meeting
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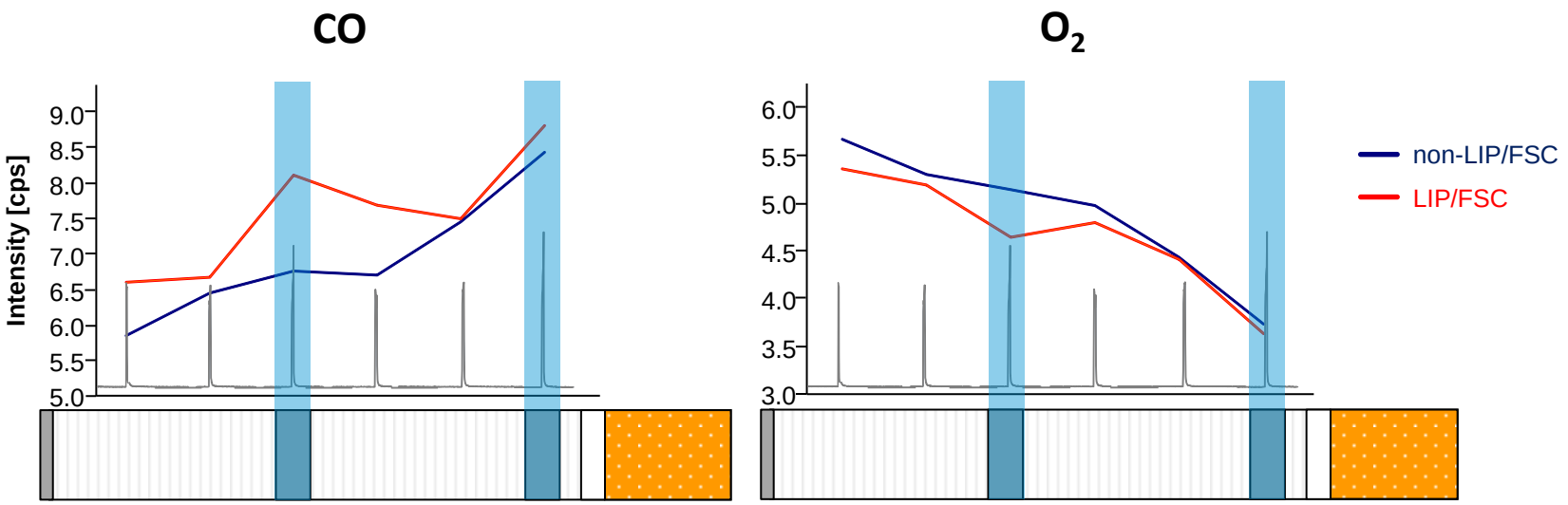
- Summary

Summary - presentation CORESTA 2012

- LIP/FSC vs. non-LIP/FSC cigarettes

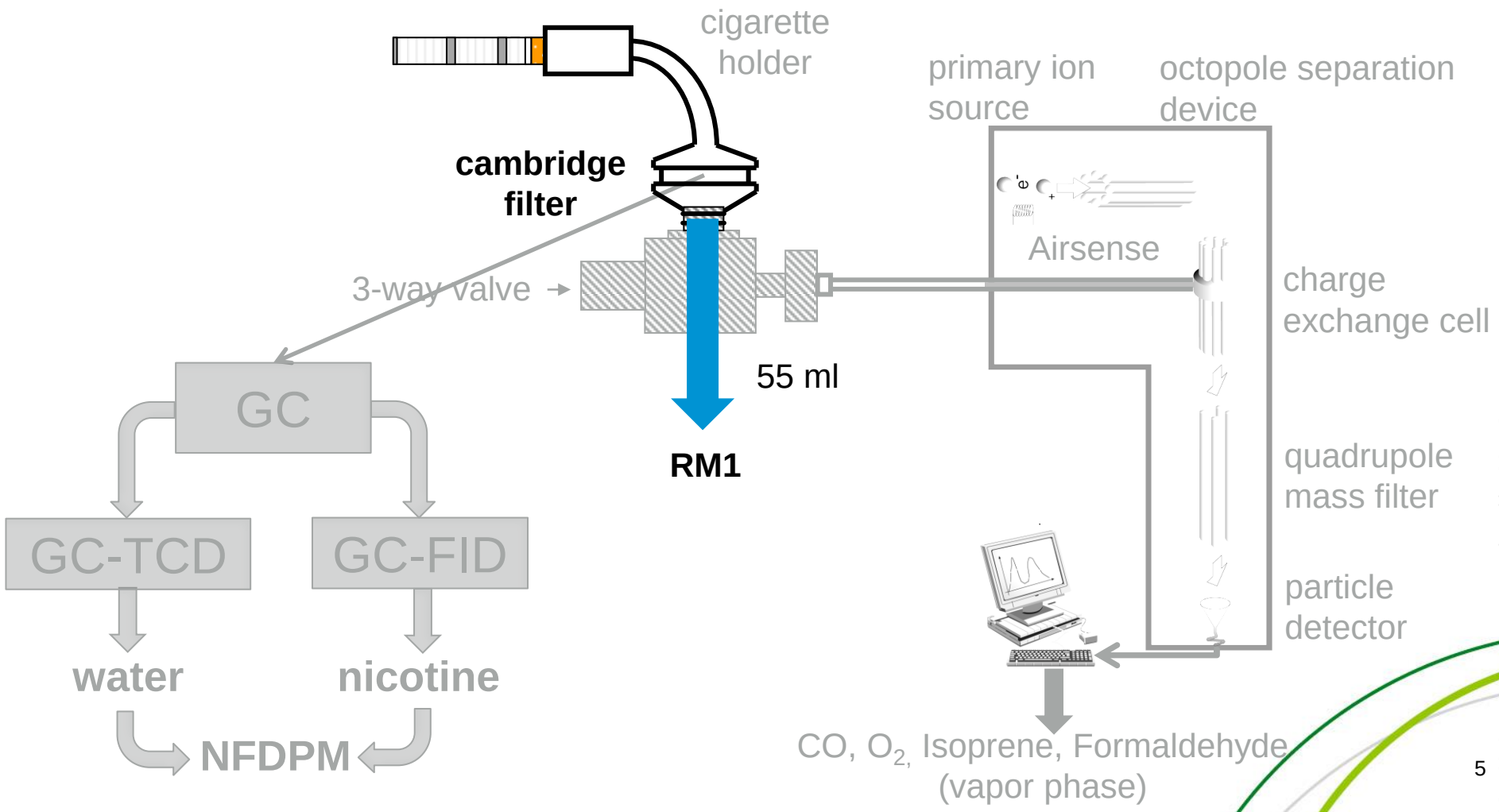


- typical puff-by-puff profile of LIP/FSC cigarettes
  - higher CO levels in banded area
  - lower O_2 levels in banded area

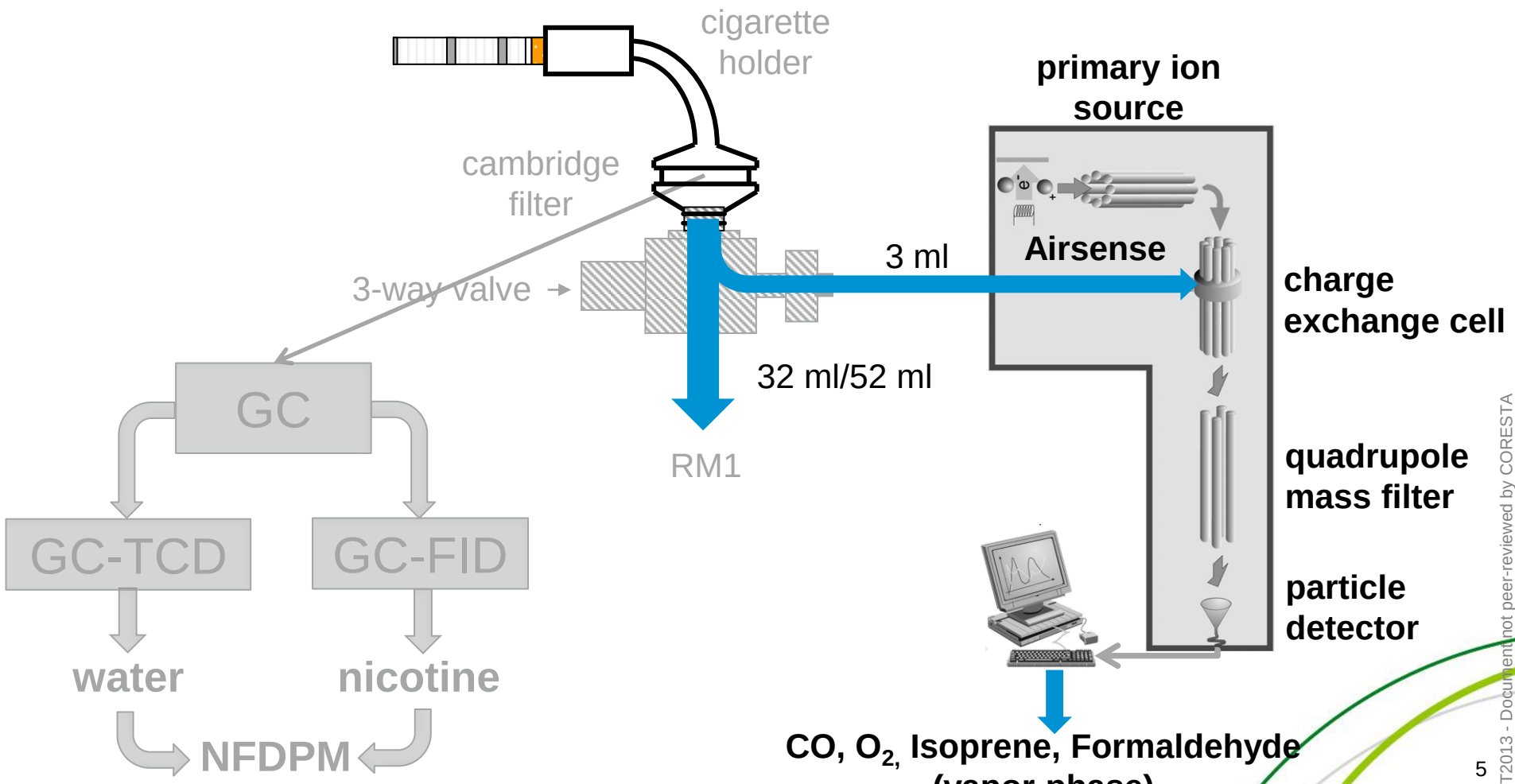
Summary - presentation CORESTA 2012

- Paper parameters
  - permeability
    - differences in CO/puff
    - same puff count
  - burn additives
    - similar in CO/puff
    - differences in puff count
  - band diffusion capacity
    - typical LIP puff-by-puff profile observed for low D* levels in the bands
    - not for high D* levels in the bands

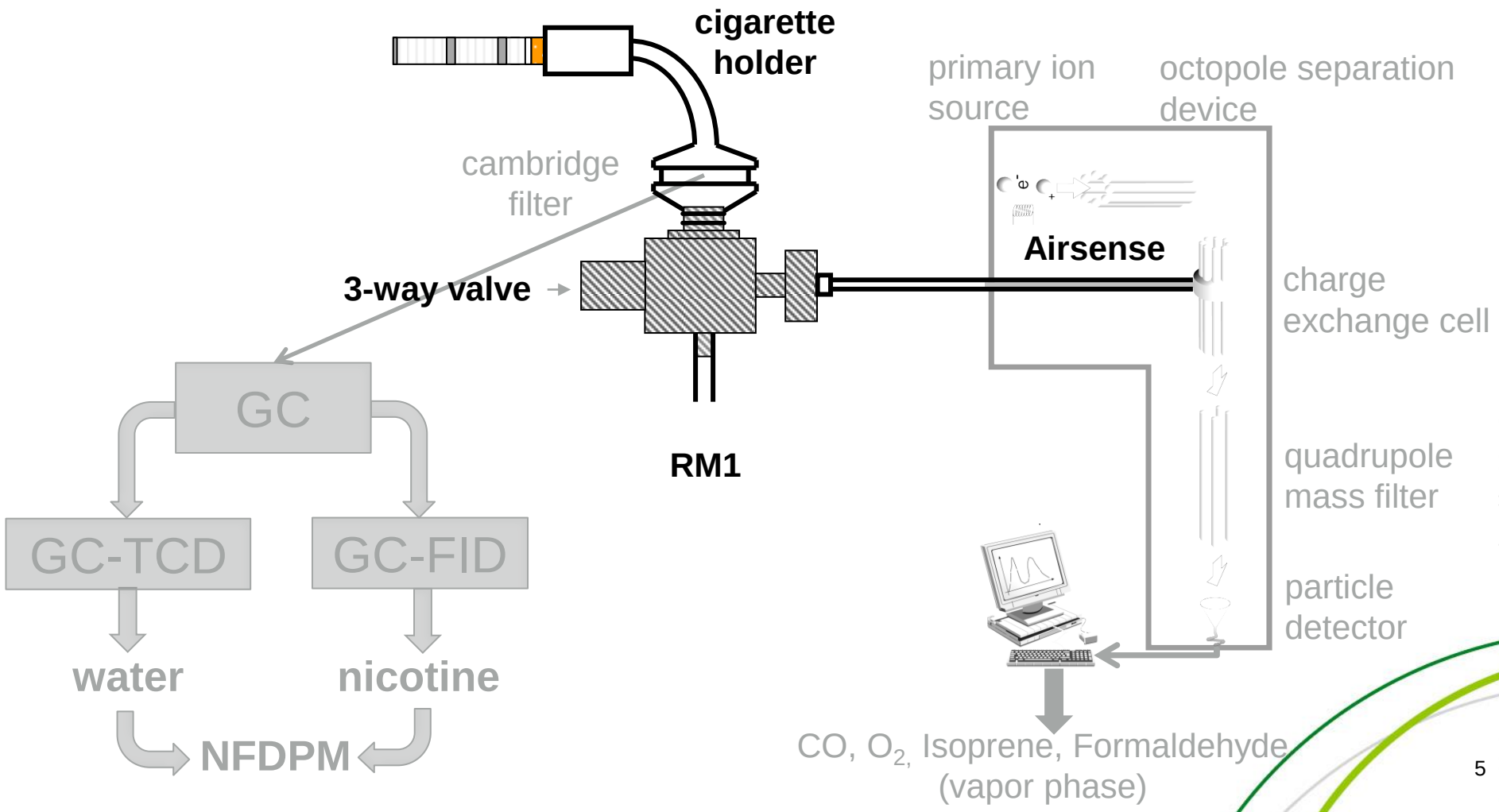
Equipment



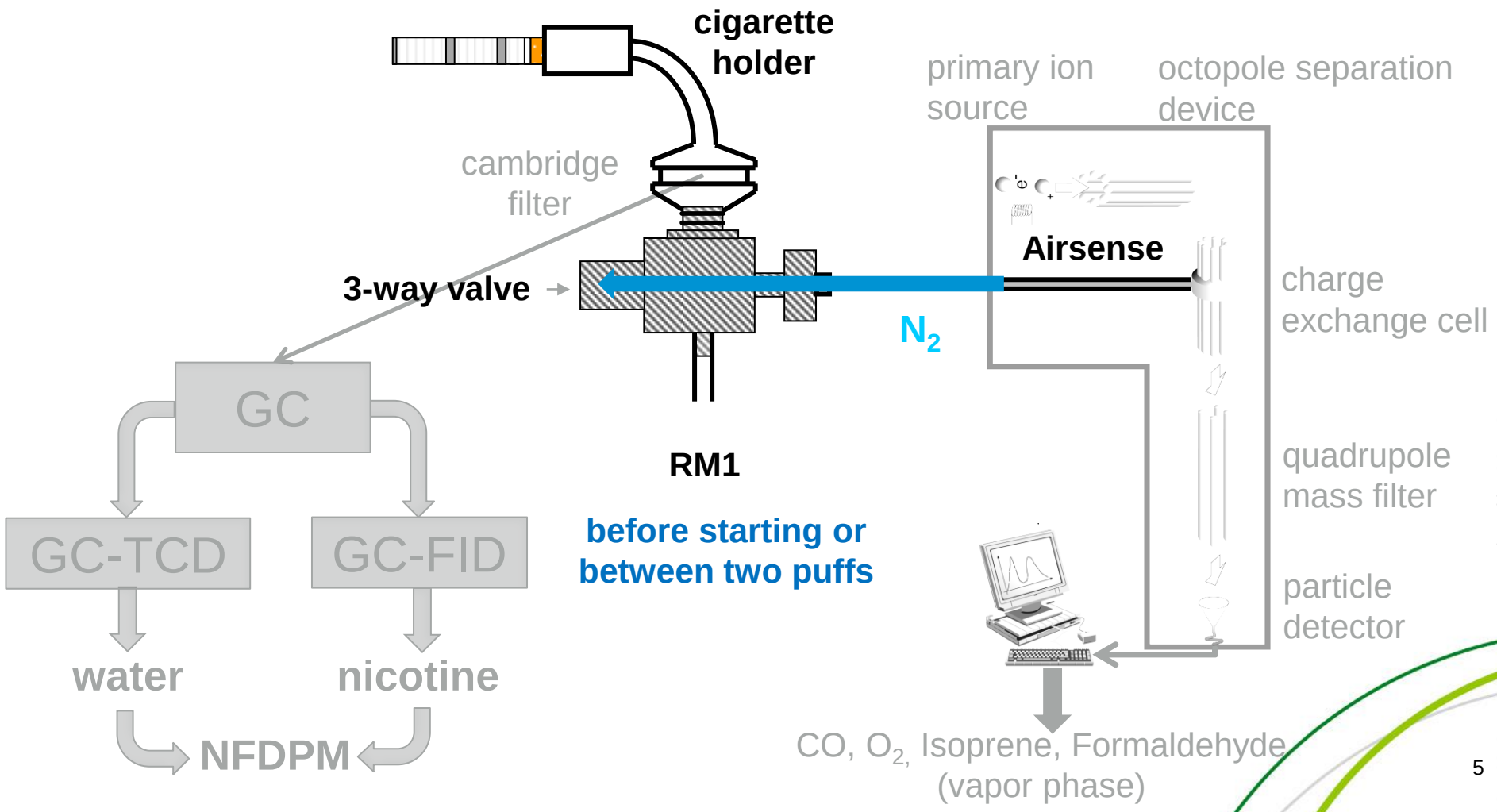
Equipment



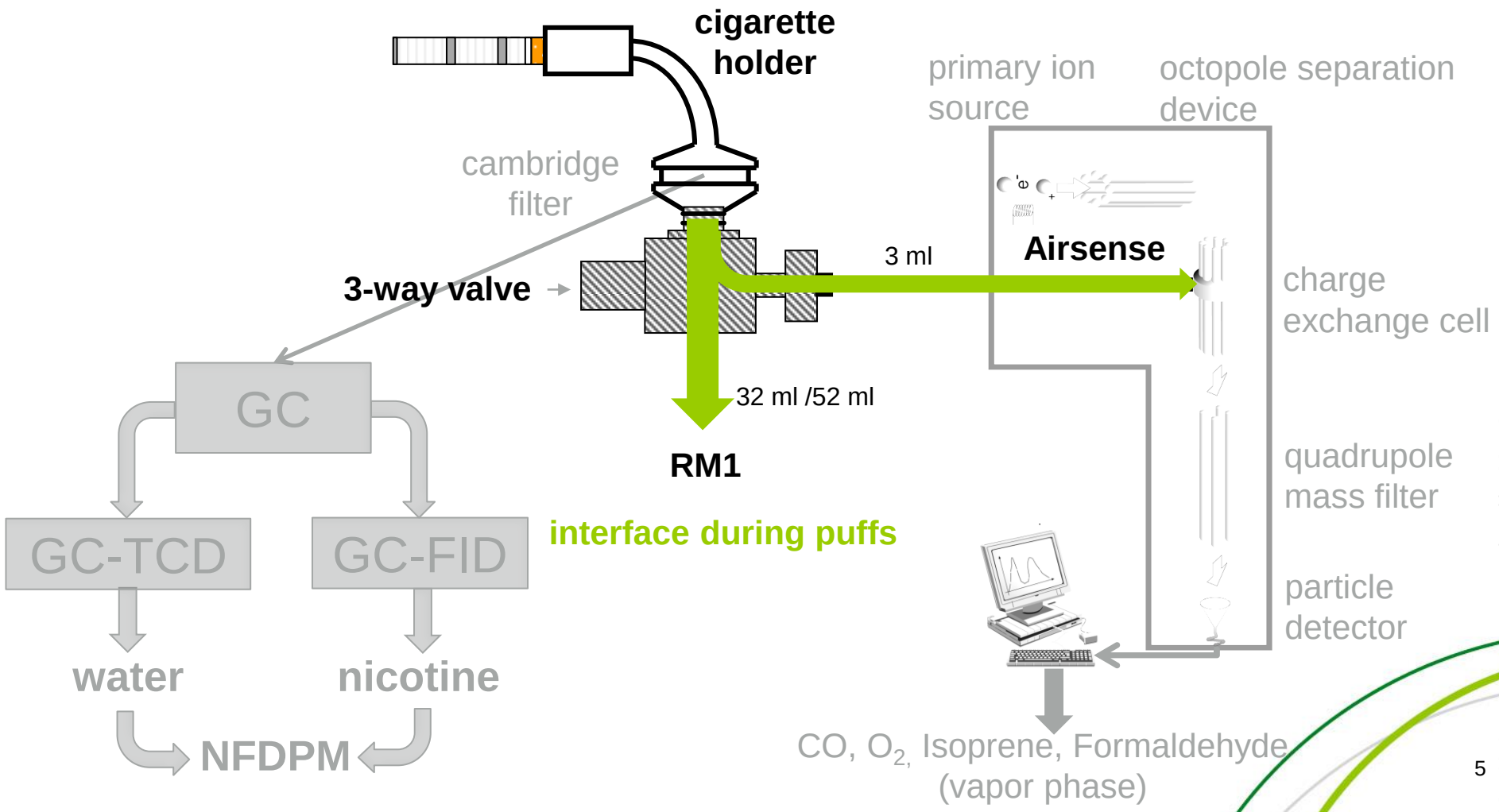
Equipment



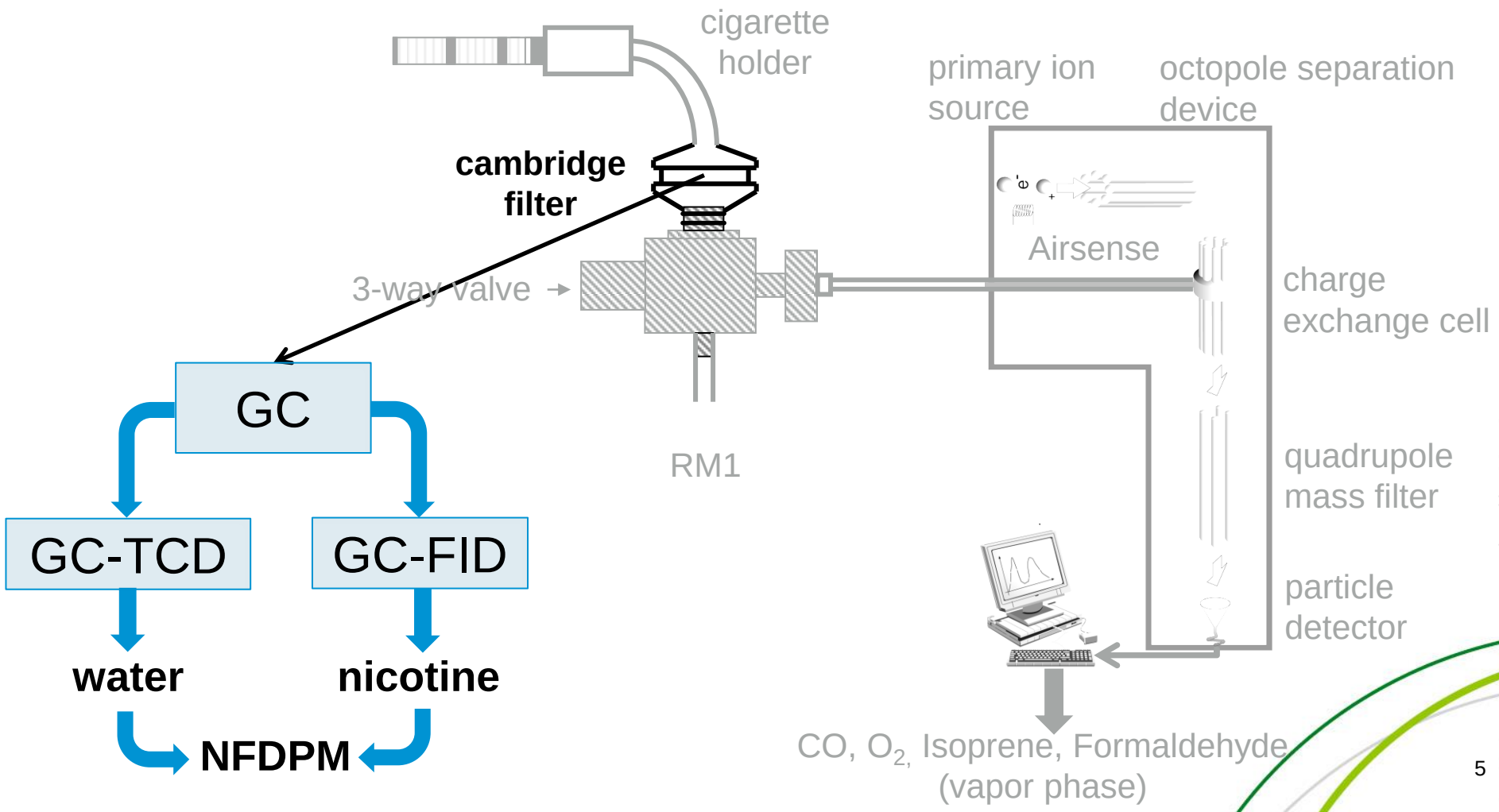
Equipment



Equipment

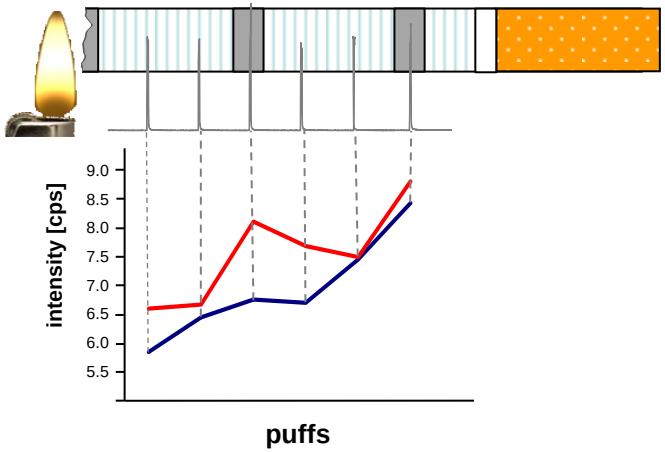


Equipment



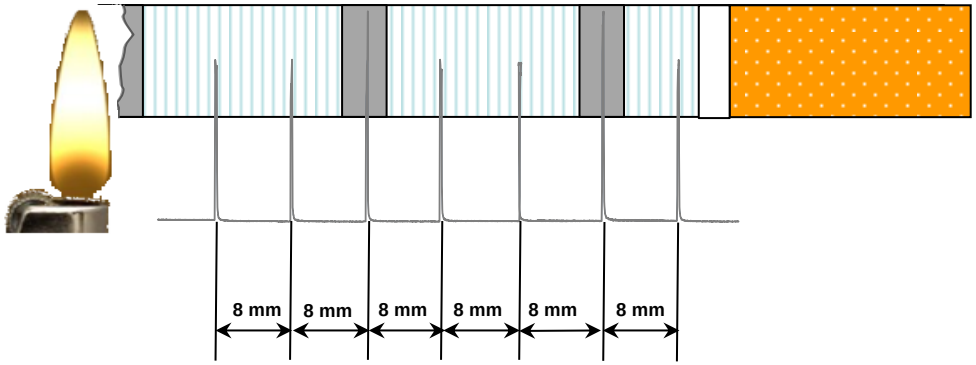
Procedure

- Measurement mode (CORESTA 2012)



according to ISO 3308

- Measurement mode (CORESTA 2013)



puff volume 55 ml
puffs taken manually

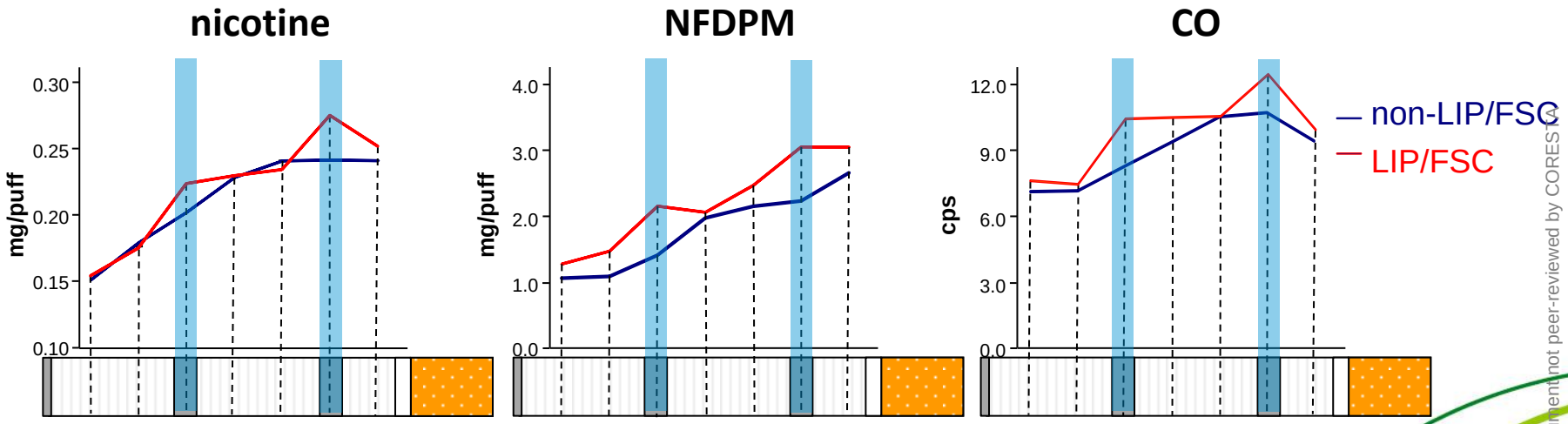
Cigarette sample set

sample	permeability [CU]	burn additive [%]	band D* [cm/s]	band design
set 1: non-LIP vs. LIP				
non-LIP/FSC	75	2	-	-
LIP/FSC	75	2	**0.05**	**6/18**
set 2: base paper parameter - permeability				
LIP/FSC [50 CU]	**50**	1	0.05	6/18
LIP/FSC [125 CU]	**125**	1	0.05	6/18
set 3: base paper parameter - burn additive				
LIP/FSC [1%]	75	**1**	0.05	6/18
LIP/FSC [2%]	75	**2**	0.05	6/18
set 4: band diffusion capacity				
LIP/FSC [0.05 cm/s]	75	2	**0.05**	6/18
LIP/FSC [0.18 cm/s]	75	2	**0.18**	6/18

Results

SET 1: LIP/FSC vs. non-LIP/FSC cigarettes

sample	permeability [CU]	burn additive [%]	band D* [cm/s]	band design
non-LIP/FSC	75	2	-	-
LIP/FSC	75	2	**0.05**	**6/18**



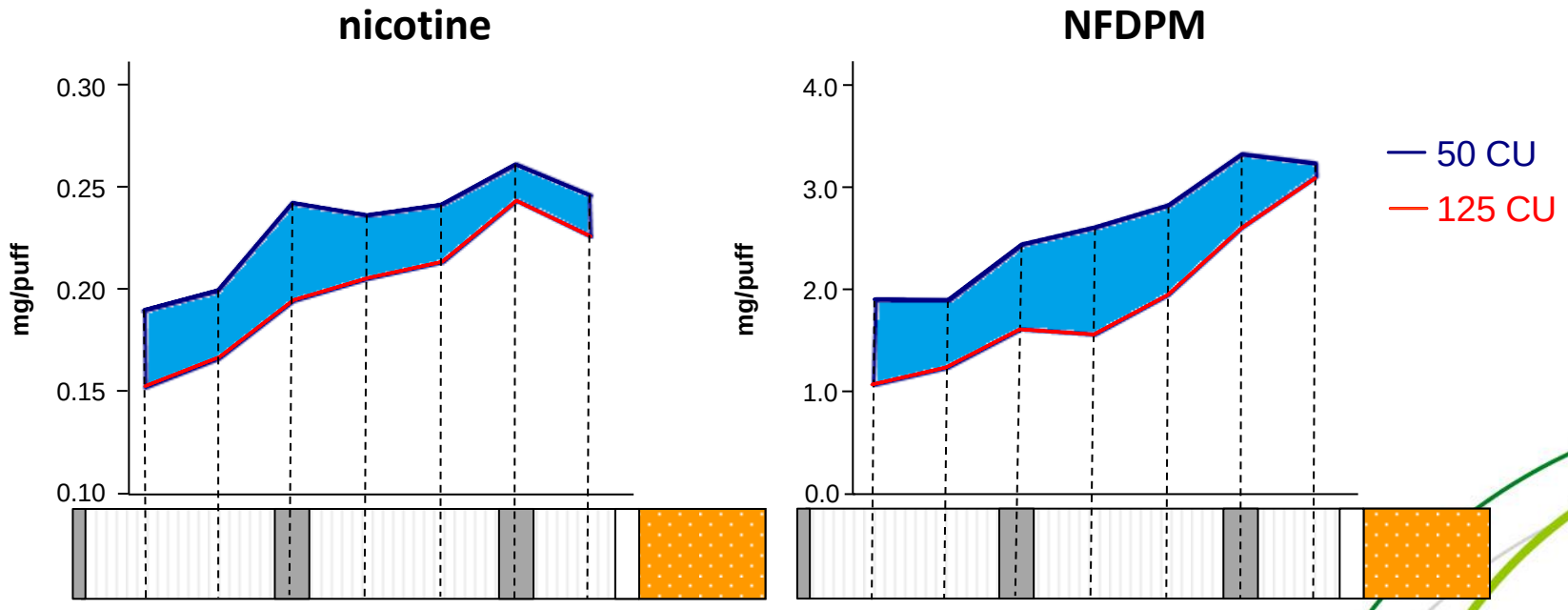
Findings

- LIP/FSC vs. non-LIP/FSC cigarettes
  - typical puff-by-puff profile of LIP/FSC cigarettes
    - higher nicotine, CO and tar levels in banded area
  - puff-by-puff profile independing of the puff volume
    - similar profile for 35 ml and 55 ml

Results

- **SET 2:** base paper parameters – permeability (50 CU vs. 125 CU)

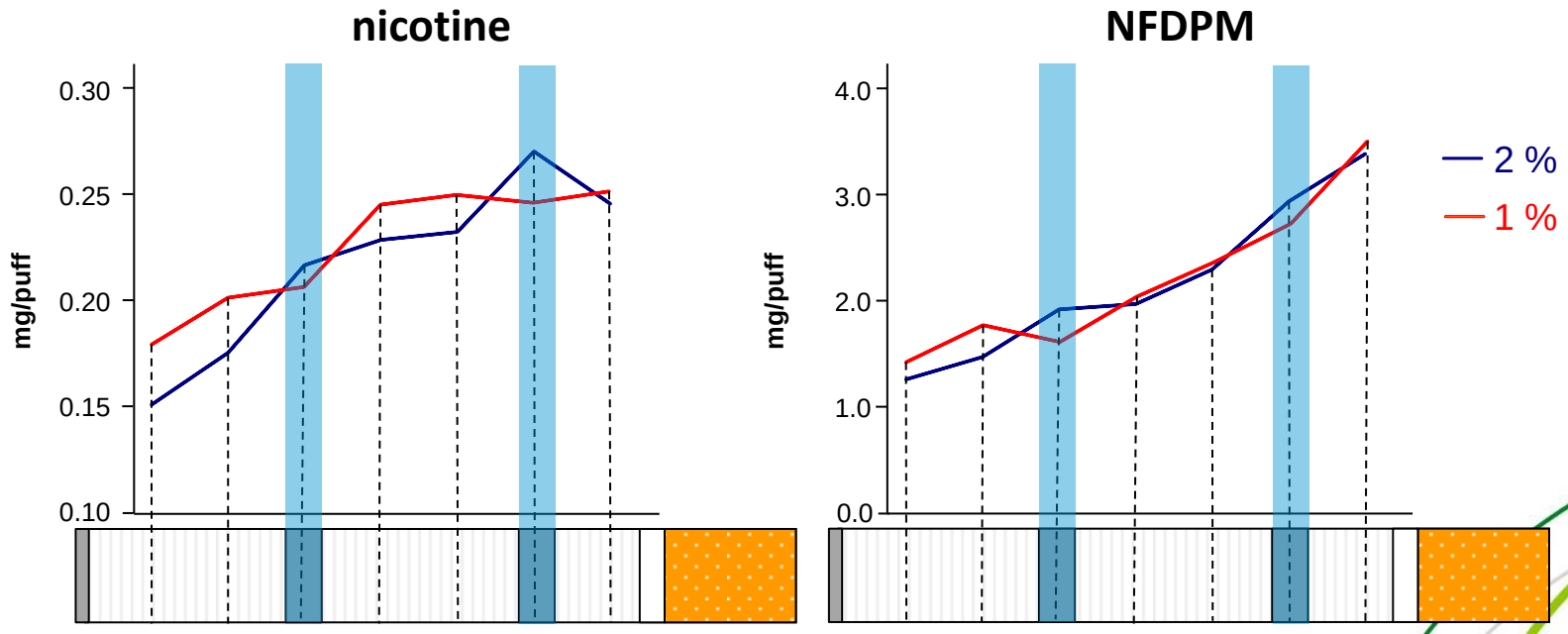
sample	permeability [CU]	burn additive [%]	band D* [cm/s]	band design
LIP/FSC [50 CU]	**50**	2	0.05	6/18
LIP/FSC [125 CU]	**125**	2	0.05	6/18



Results

SET 3: base paper parameters – burn additives (1% vs. 2%)

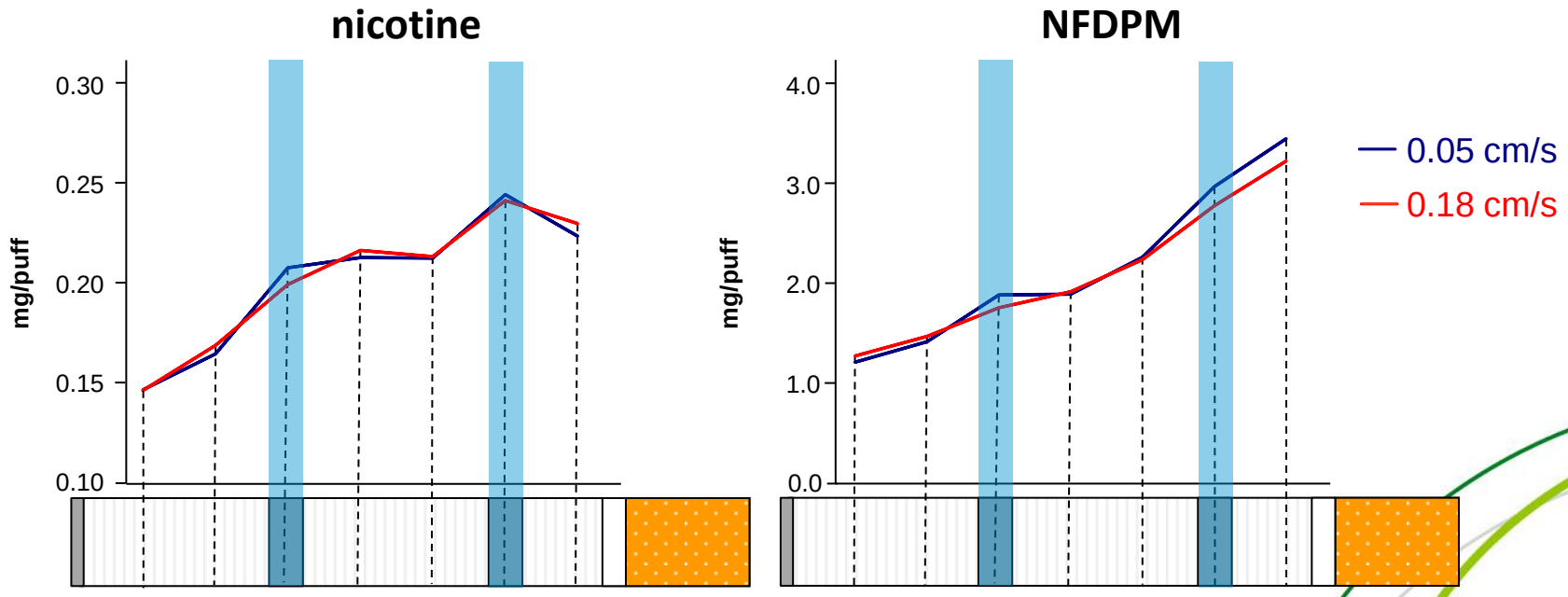
sample	permeability [CU]	burn additive [%]	band D* [cm/s]	band design
LIP/FSC [1 %]	75	**1**	0.05	6/18
LIP/FSC [2 %]	75	**2**	0.05	6/18



Results

- **SET 4:** band diffusion capacity (0.05 cm/s vs. 0.18 cm/s)

sample	permeability [CU]	burn additive [%]	band D* [cm/s]	band design
LIP/FSC [0.05 cm/s]	75	2	**0.05**	6/18
LIP/FSC [0.18 cm/s]	75	2	**0.18**	6/18

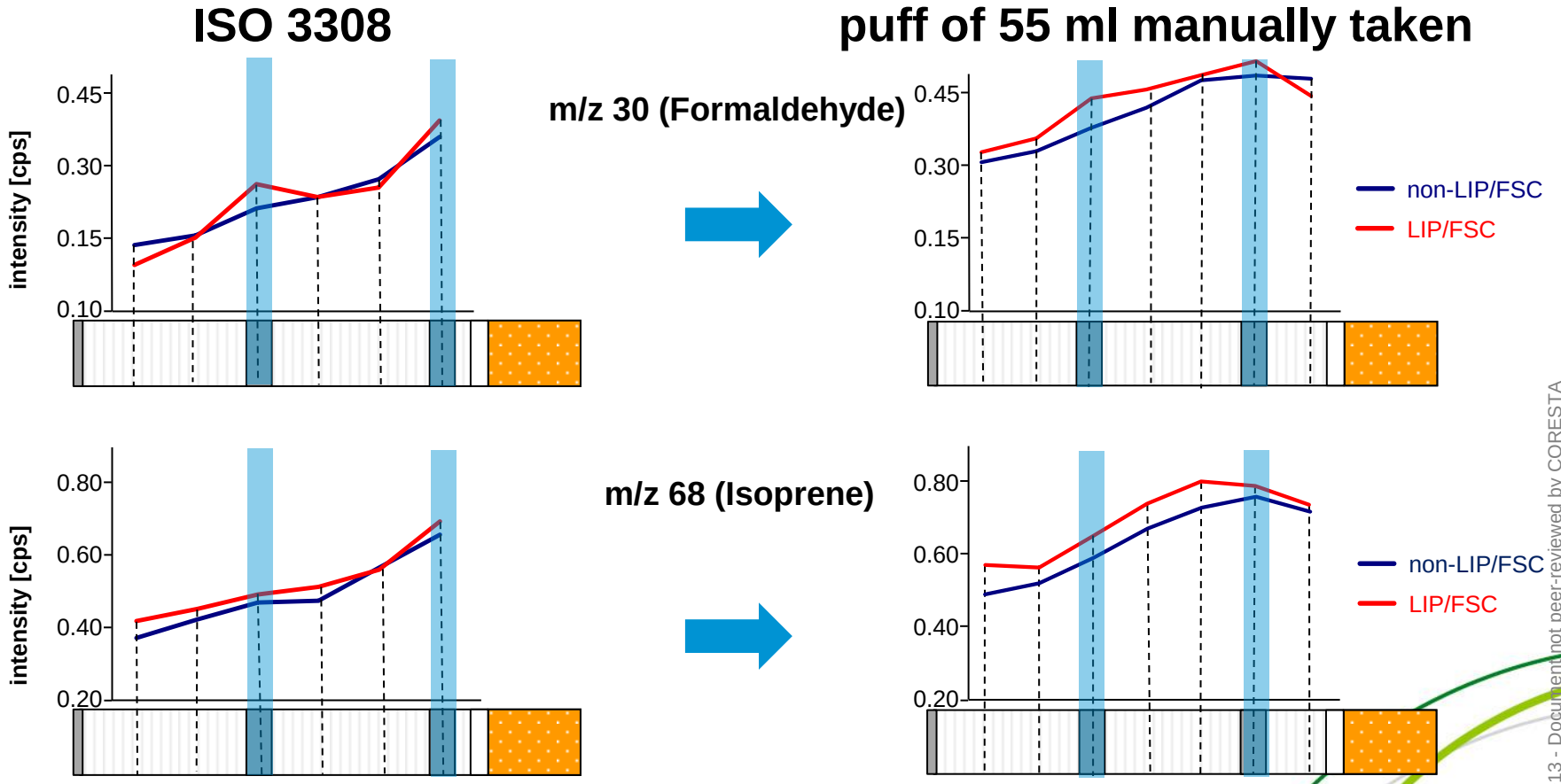


Findings

- Paper parameters
  - permeability
    - typical puff-by-puff profile independing of the permeability
      - differences in nicotine and tar/puff
  - burn additives
    - puff-by-puff profile depends on the burn additive level
      - 1% → cigarette nearly self-extinguishes during smouldering in the band
      - 2% → typical puff-by-puff profile
  - band diffusion capacity
    - typical puff-by-puff depends on the diffusion capacity level
      - 0.05 cm/s → typical puff-by-puff profile
      - 0.18 cm/s → profile not so distinctive

Other analytes

- Trends observed for other analytes



Summary

- Typical puff-by-puff profile of LIP/FSC cigarettes
  - higher nicotine, tar and CO levels in banded area
  - lower O_2 levels in banded area

  exception: sample with high band diffusion capacity and with lower burn additive level

- Puff-by-puff profile independing of the puff volume
  - higher puff volume leads to higher values

- Trends for other analytes
  - Puff-by-puff profile depends on the type of analyte

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