Smoke Generator Performance Assessment

IASFPF 08-09 May 2018

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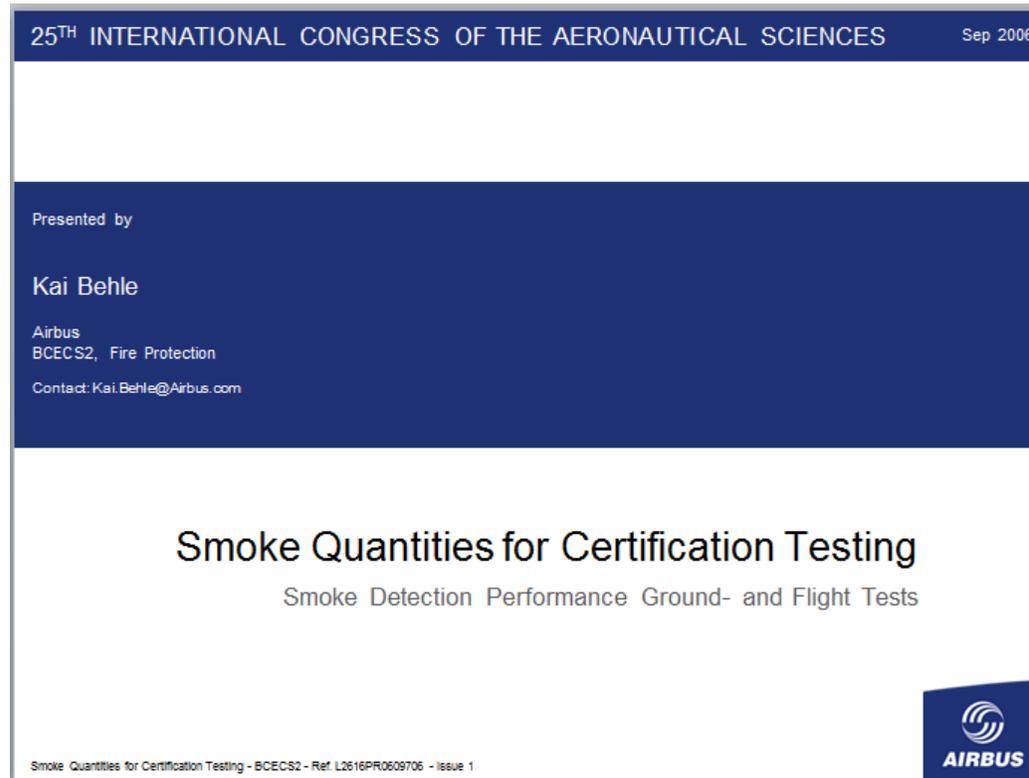
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Background

How shall a reference smoke generation source for future smoke detector integration verification look like?
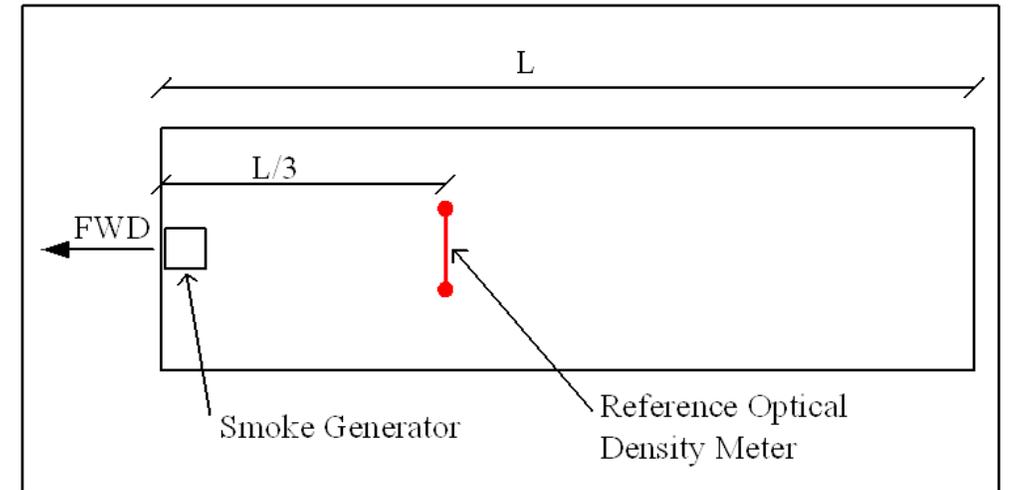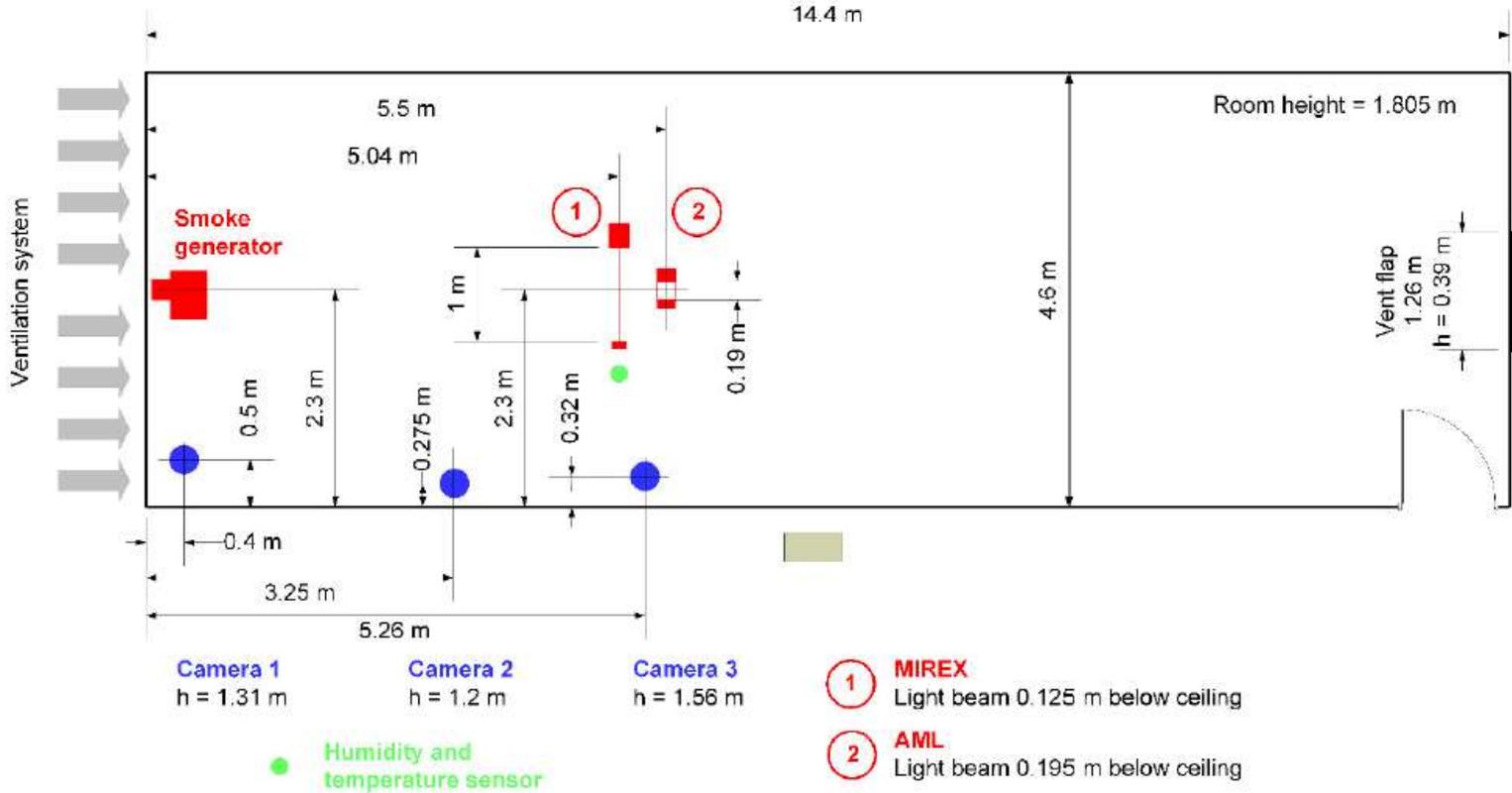
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2005 Assessment

This assessment has been used by Airbus since 2005

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2005 Assessment

The shown values are the result of only one measurement for each program sequence:
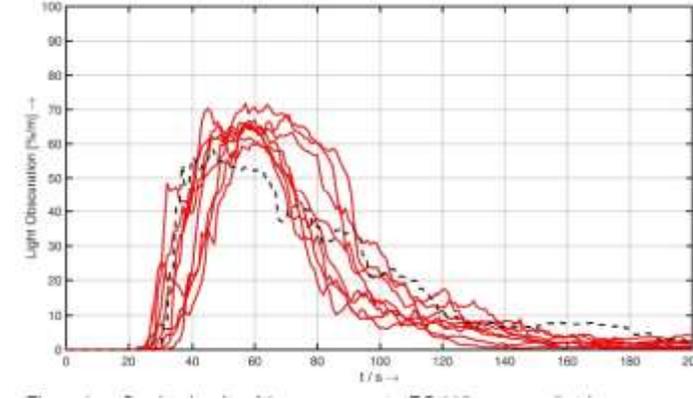No statistical evidence.

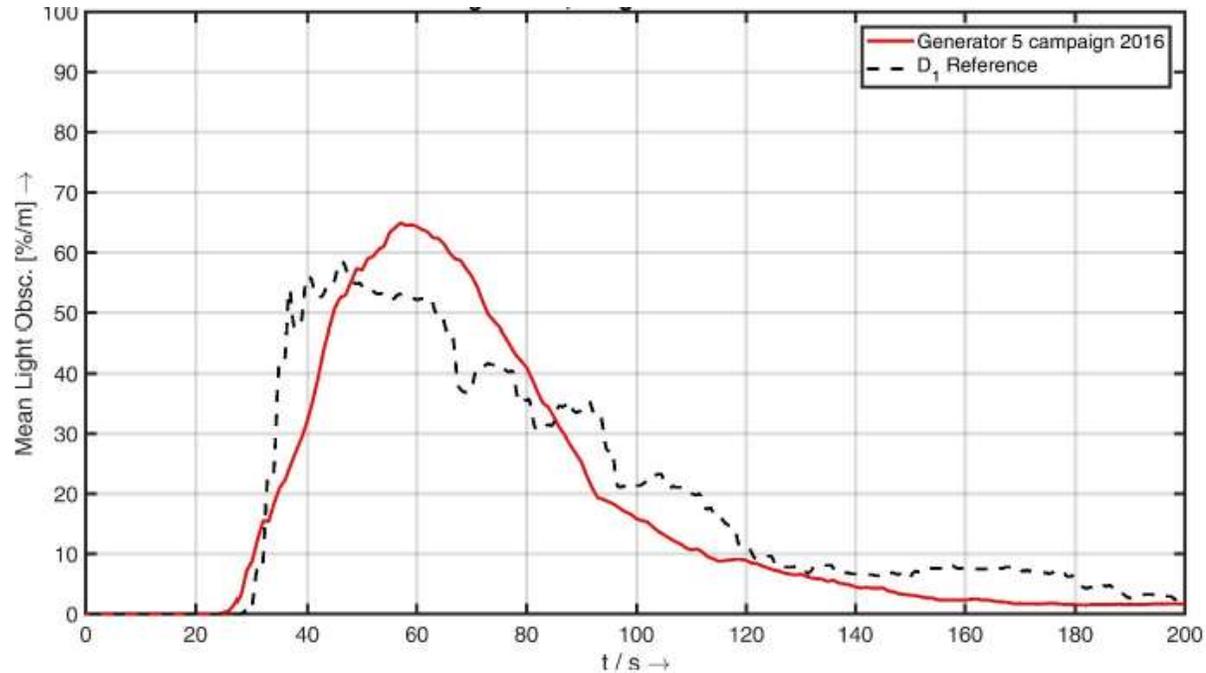08 May 2018   Smoke Generator Performance Assessment - ECD1Y - Ref. PR1804245 - Issue 2

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2017 Are-assessment

The 2005 setup was reproduced and documented in more detail

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Test Mock-Up with MIREX and AML

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Recent studies: Re-assessment of "reference curve"

Siemens Smoke Generator

- Smoke Generator Light Obscuration shows good average match
- Statistical deviations
- Justification for averaging during flight testing

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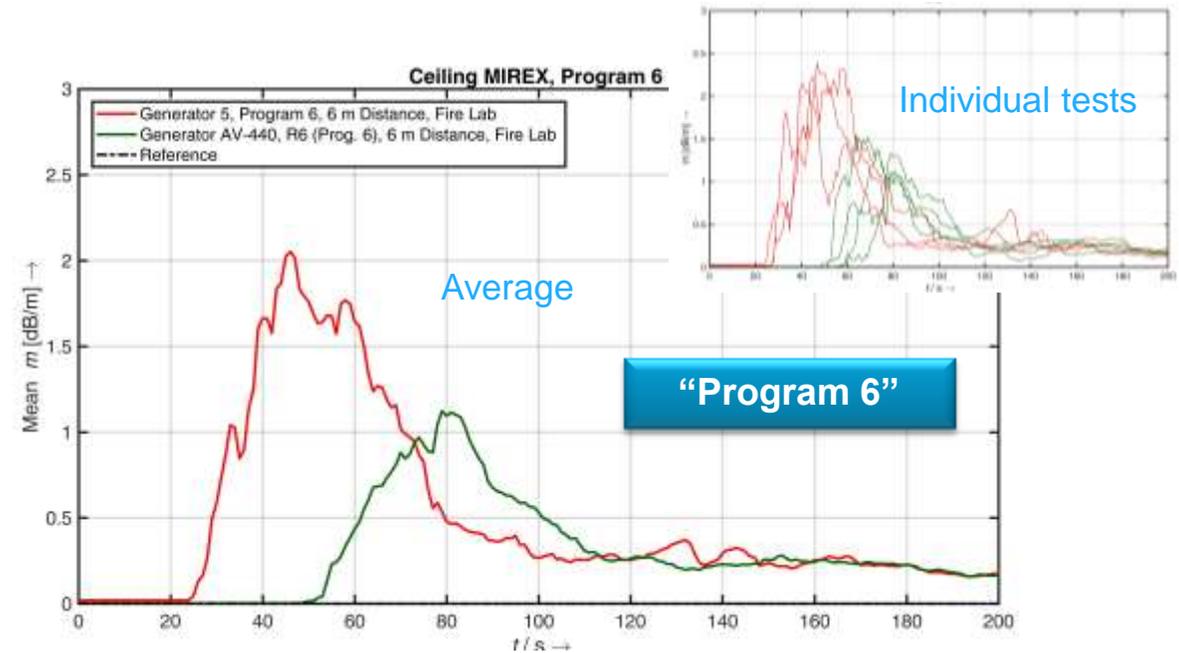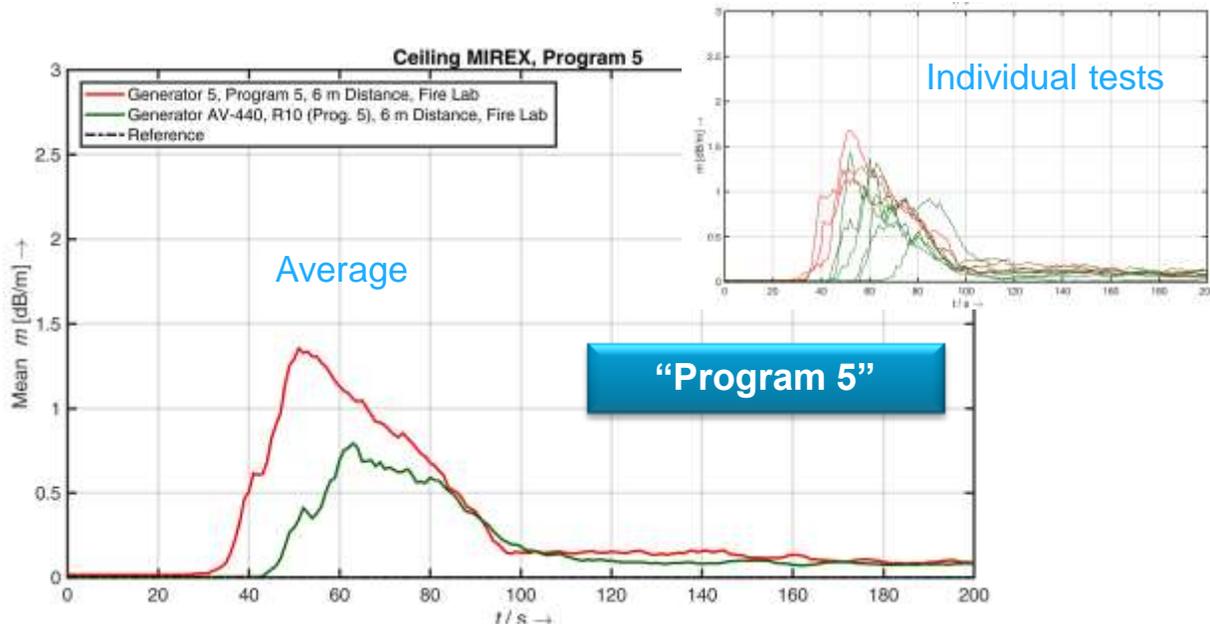# Recent studies: Re-assessment of "reference curve"

Aviator Smoke Generator
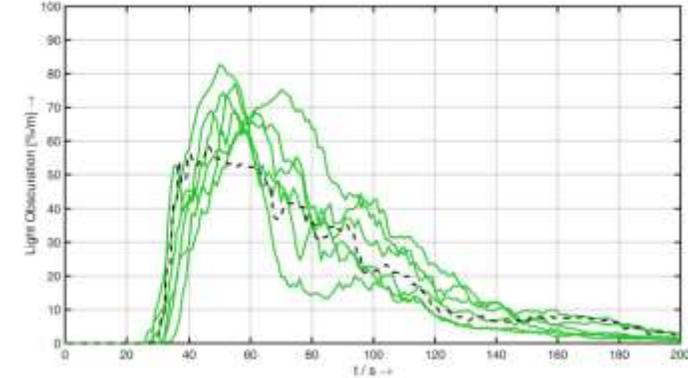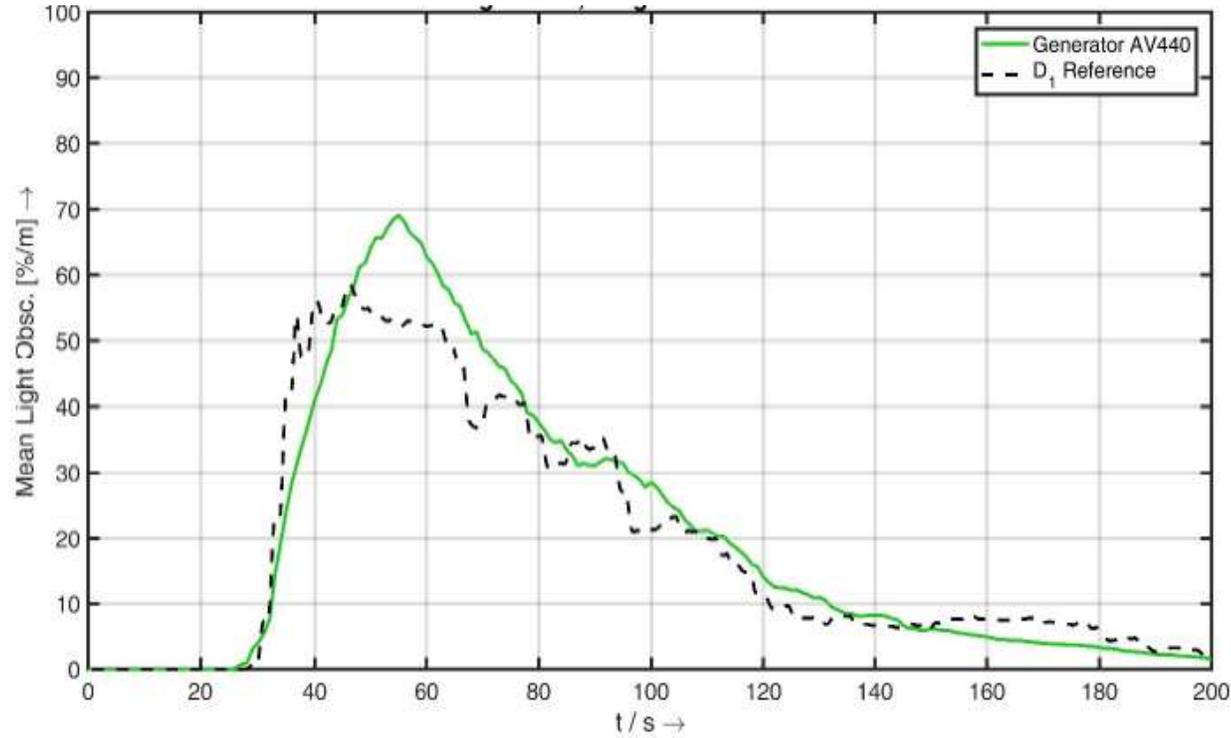
- Settings for the Aviator Smoke Generator could be achieved to match with the 2005 reference curve

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Smoke Density Measurements in EN54 room environment

- In a different environment (EN 54 room), the results of smoke density measurements differ between the 2 generators.
- Smoke dynamics and spreading becomes visible in the enlarged room with higher dilution

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Particle Size distribution measurement

- The data were recorded with the Palas-Welas system
- It counts the number of particles of 192 size-classes in the range of particles with diameters d = 0.2 - 10 μm.
- A dilution system with a dilution factor of 1:10 was implemented just before the Palas-Welas system due to high expected smoke concentration

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Particle size distribution of smoke generators under test
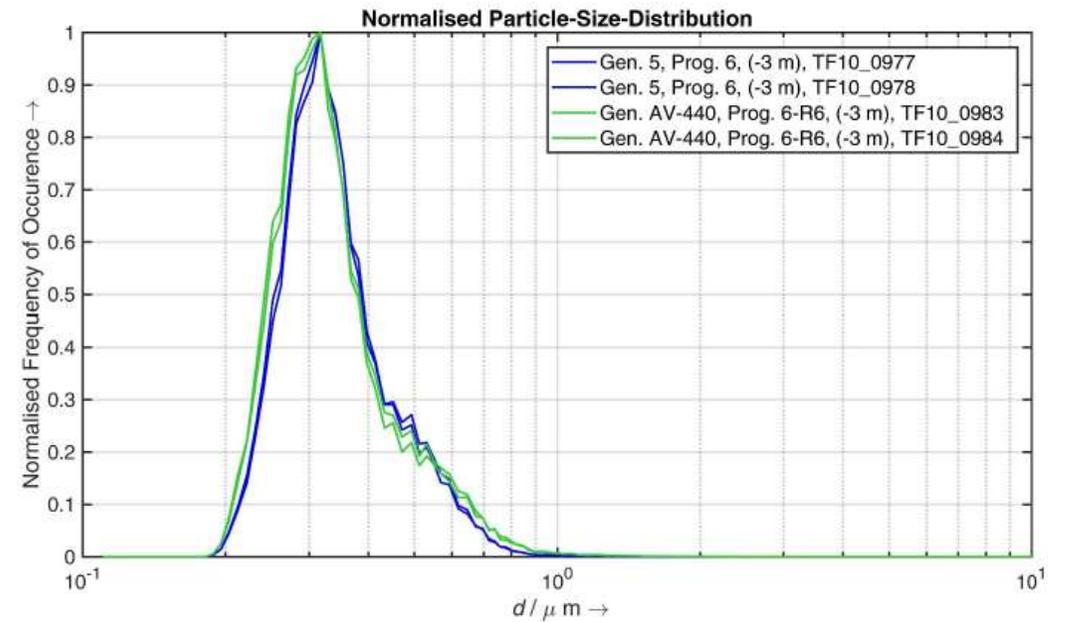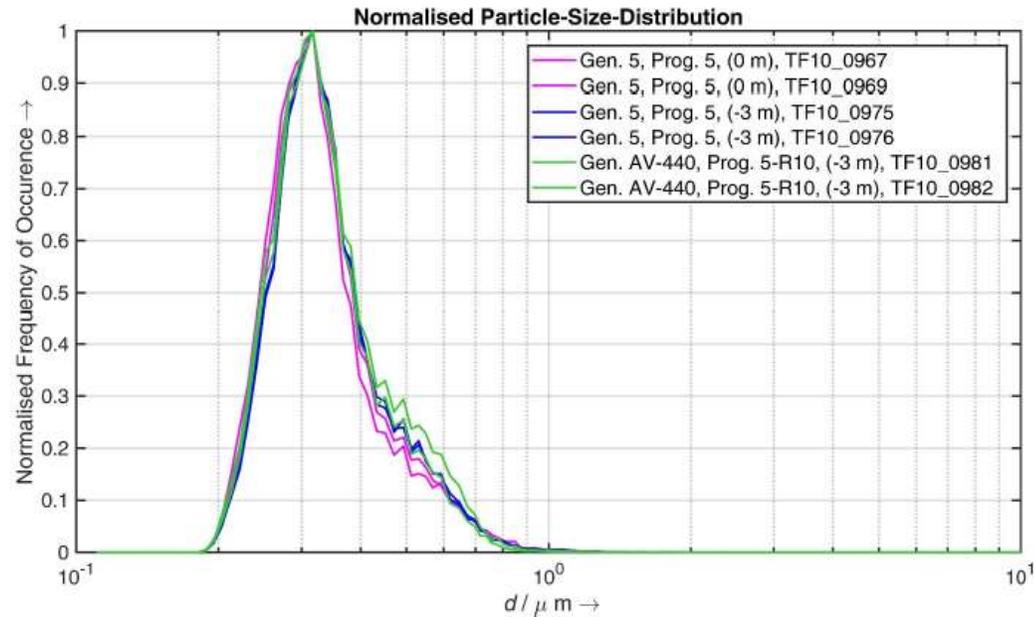
Particle size distribution of Siemens and Aviator Smoke Generator are matching

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Conclusion

Summary

- Siemens and Aviator smoke generators show good match in unventilated wooden aircraft cargo compartment mock-up
- Different results for Siemens and Aviator Smoke Generator occur in a different environment (EN54 room)
- Particle size distribution matches well between Siemens and Aviator Smoke Generator

Next steps

- Discussion on feasibility of a standardized smoke generator calibration approach
- International agreement on reference
- Investigations on in-flight changes of smoke generator application (cabin pressure, cargo door leakage, etc.)
- Correlation to Smoke Detector responses

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Thank you

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