
MAKING “SENTIENT” AIR MONITORS: AUTOMATING QA/QC ON OPEN PATH FENCE LINE MONITORING SYSTEMS

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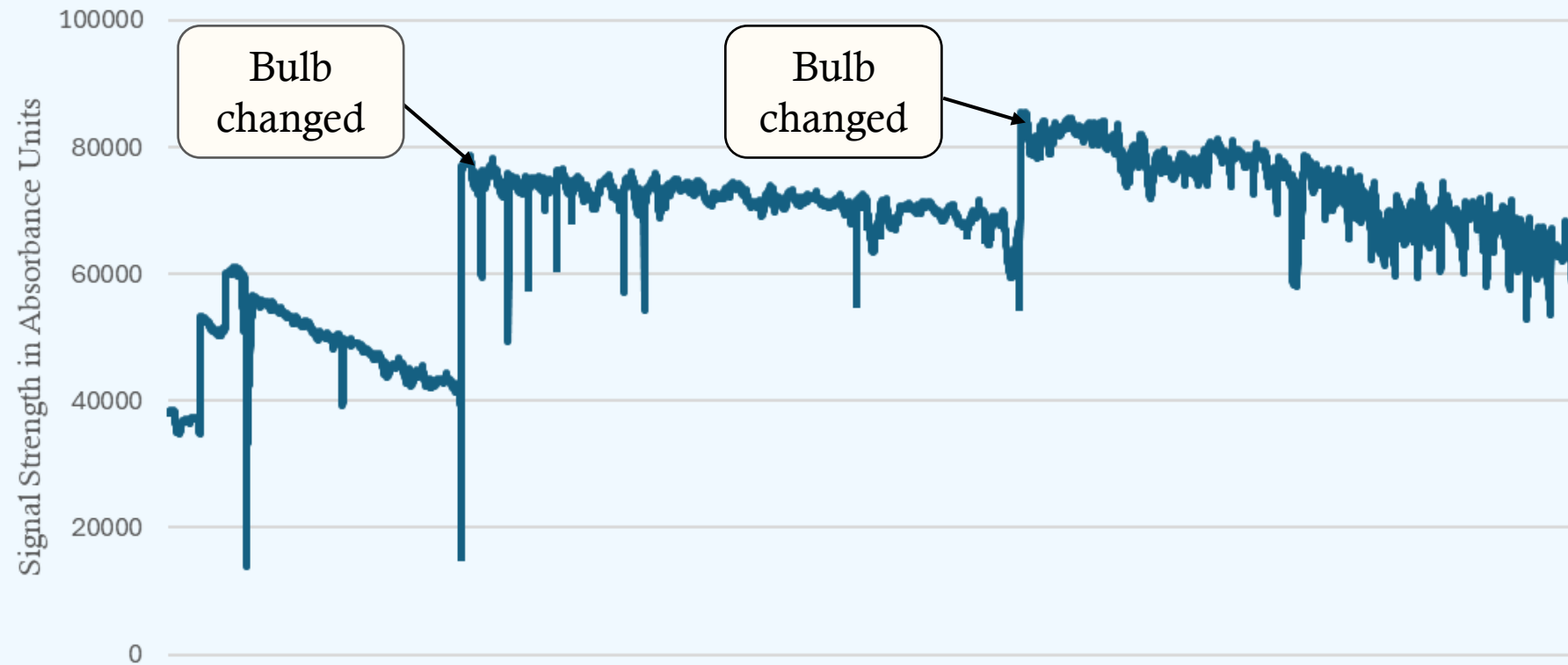
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WHAT ARE THE PROBLEMS?

- Manual QA is “boring” and slow
 - QA requires the system to be down, reducing on stream efficiency
 - Hard to spot system degradation when QA is only running monthly
 - Lack of accessible air quality data
 - Requires a PC and knowledge of where the data is located online
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DEGRADATION VISUALIZED

Example 2 Months of System Signal Strength Without Automated Procedures

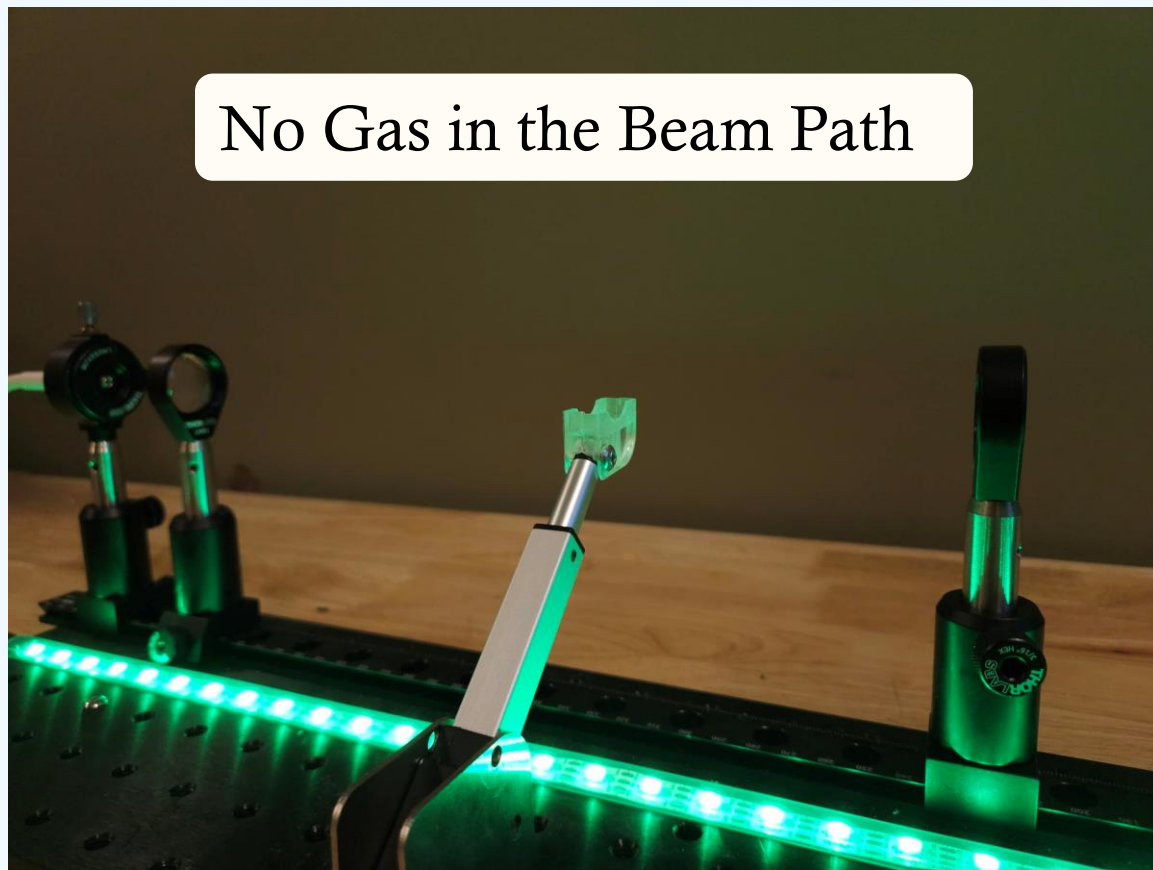


THE PLAN

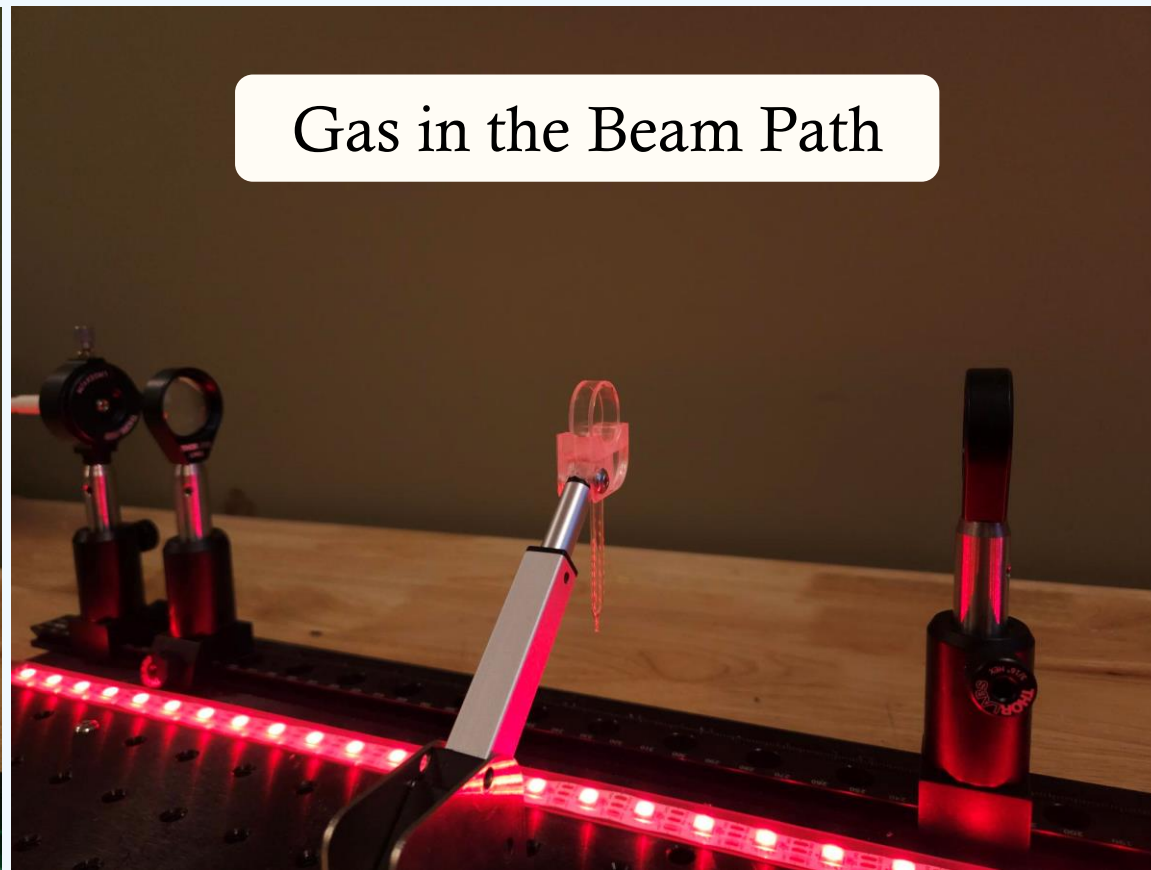
- Have the software manage QA/QC
 - Modular software to fit specific site requirements
 - Run QA daily to spot system degradation in a timelier manner
 - Add visual indicators representing the current state of the air quality
 - Integrated notification system that informs end user of active detections
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VISUAL INDICATORS AND PUBLIC ENGAGEMENT

No Gas in the Beam Path



Gas in the Beam Path



TESTING OF SENTIENT AIR MONITORS

- Incremental testing
 - Local test bench setup
 - BCAMP system running the new software
 - Have data analysts verify the integrity of the reports generated
 - Verify LEDs update appropriately
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AUTO QA/QC IN ACTION

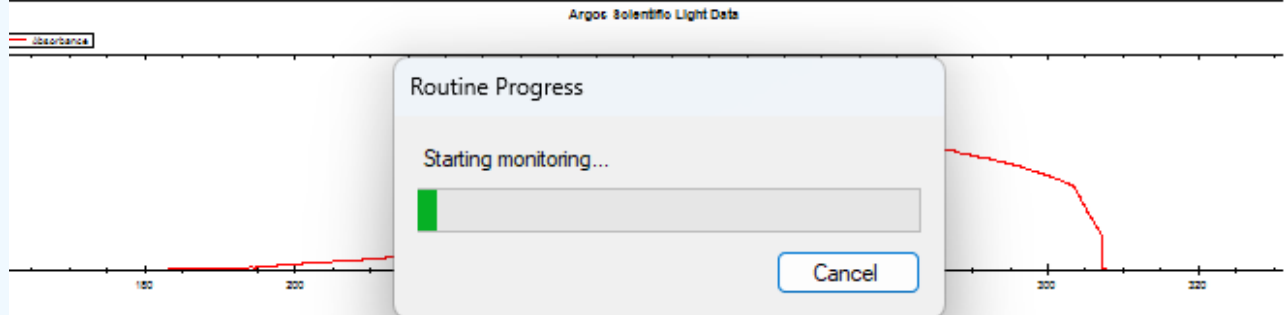
Log File

```
1 QA started at: 6/14/2024 3:27:00 PM
2 Initial File number: 56591
3 Signal Strength: 26392.75
4 Integration Time: 750ms
5 Turing auto background for gasses off
6
7 Checking for any active detection
8 FileNumber:56592
9 ben concentration: -0.90304ppb r2: 0.05
10 so2x concentration: -0.68216ppb r2: 0.05
11 xyl concentration: -1.67281ppb r2: 0.01
12 eben concentration: -1.47851ppb r2: 0
13
14 FileNumber:56593
15 ben concentration: -2.90304ppb r2: 0.04
16 so2x concentration: -0.61476ppb r2: 0.05
17 xyl concentration: -2.47248ppb r2: 0.01
18 eben concentration: -1.91851ppb r2: 0
19
20 FileNumber:56594
```

Spectrometer Settings

Serial	QEP00456	Collection Time (s)	30	Background Update	On
Name	QE-PRO	Integration Time (ms)	750	Actuators Connected	0
Status	Connected	Number of Averages	40		

```
[2024-07-11 15:44:00] Performing routine "AutoQA".
[2024-07-11 15:44:00] Waiting...
[2024-07-11 15:44:00] Collecting data from spectrometer...
[2024-07-11 15:44:30] Collecting data from spectrometer...
```



QA Running
Automatically

BENEFITS

- Increase system efficiency
 - The software can produce reports much faster than a user could
 - More reports allow for system degradation to be spotted earlier
 - Reduce the amount of man hours
 - Anyone can observe their local air quality
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QUESTIONS?

CONTACT

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