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# FLASH-M Software Sensor for PASSIVE Real Time Screening and Detection of SARS-nCOV-2 COVID-19 AND H1N1

**Briefing Prepared For Millennium Technologies**

*Submitted to: Jimmy Whitehead | Lauren MacDonald*

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# HNU Photonics-SCORPIO V is a Science and Technology Company Creating Cutting Edge Technologies

- Commercial
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- Space Based
- CLASSIFIED Programs
- Medical Imaging Technologies
- Renewable energy
- Laser Beam Control
- Beam Projectors and receivers
- Multidimensional Sensor Technology





## FLASH-M



FLASH is a passive, real-time screening and detection of SARS-CoV-2, COVID-19, ready for immediate trial through Millennium Technologies. FLASH requires no physical samples, only a Real-Time image of the person being screened. The FLASH screening process is self-calibrating, taking only seconds to complete, and is as easy as taking a photo with phone.

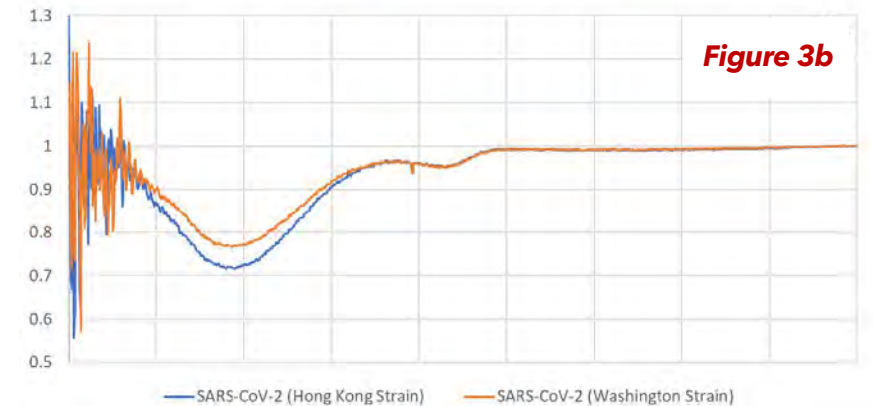
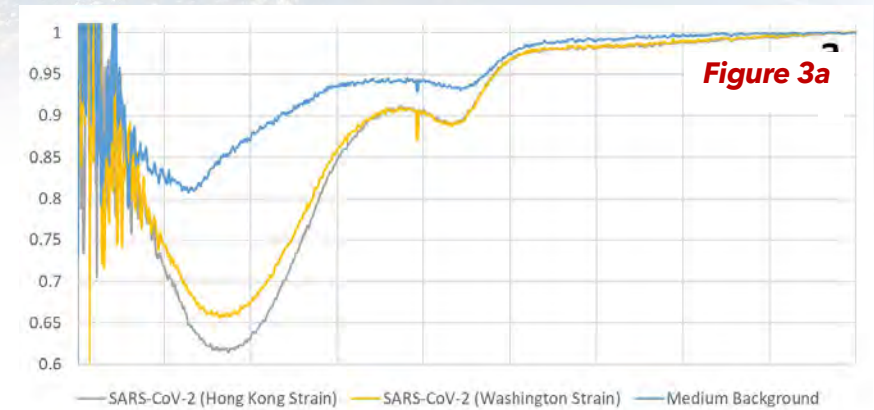


# Evidence

## FLASH-M Preliminary Results for SARS-CoV-2 Detection

Two strains of SARS-CoV-2 were provided by Microbiologics Inc. for FLASH-M calibration tests. The graphs above outline the difference between the background medium measurement and the measurements of the two strains of SARS-CoV-2 (Hong Kong strain and Washington State strain). Figure 3a illustrates the significant difference in peak magnitude between the background medium and the two virus strains. In addition, there is a distinct peak shift of approximately 20 wavenumber units between the background medium and the two virus readings, suggesting that this peak is unique to the virus.

Figure 3: (a) Absorbance of SARS-CoV-2 virus strains from Hong Kong and Washington State compared to the background medium and (b) absorbance of both viral strains with the background medium subtracted. Viruses were provided by Microbiologics Inc. at a concentration of  $7.0 \times 10^9$  (Washington State) and  $7.8 \times 10^9$  (Hong Kong) viral copies per milliliter.



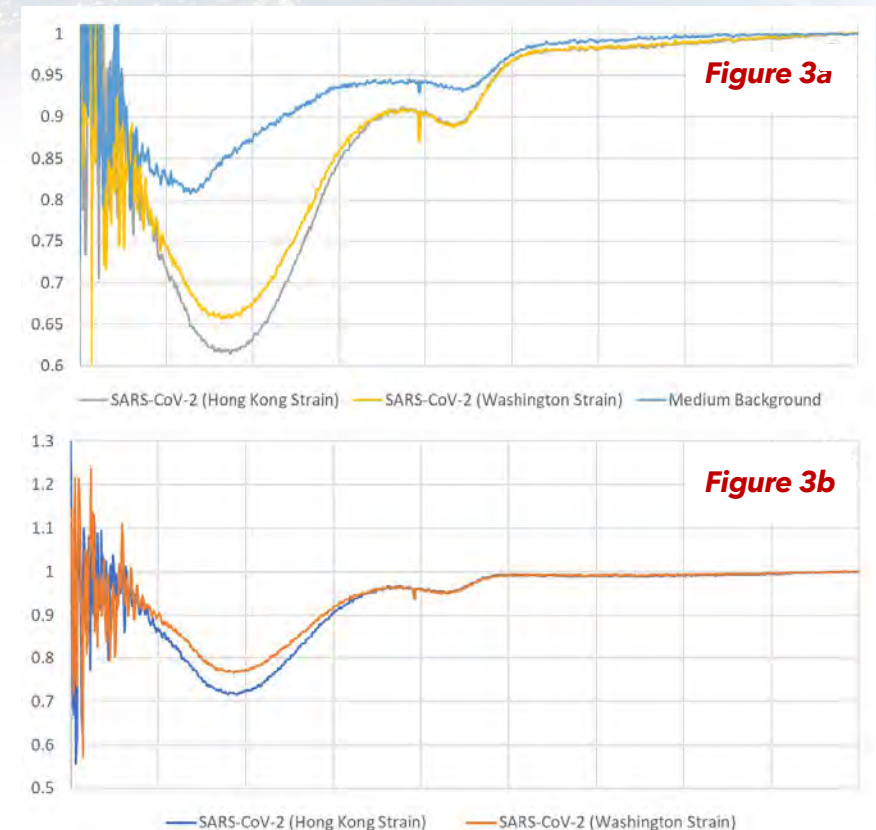




## Evidence (continued)

Figure 3b baselines the background medium from the reading of the two viruses to better quantify the differences between the two strains and the background medium. The results show that there's up to a 30% difference between the background and virus readings. Furthermore, Figure 3b illustrates a slight difference (~8%) between the two virus strains.

In addition to the SARS-COV-2 Target Signature (TS) identified in Figure 3, FLASH-M has been able to quantify the concentration of SARS-CoV-2 within human saliva. Figure 4a depicts the TS of SARS-CoV-2 in human saliva at concentrations ranging from 0 (saliva control) to  $7.8 \times 10^8$  virus particles. Further quantification of the spectra with HNu Photonics proprietary software reveals a correlation between virus concentration and the processed virus absorbance values to as low as  $7.8 \times 10^5$  particles (Figure 4b).

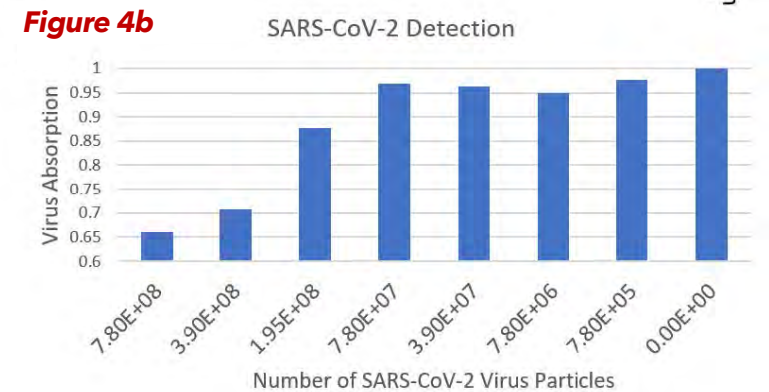
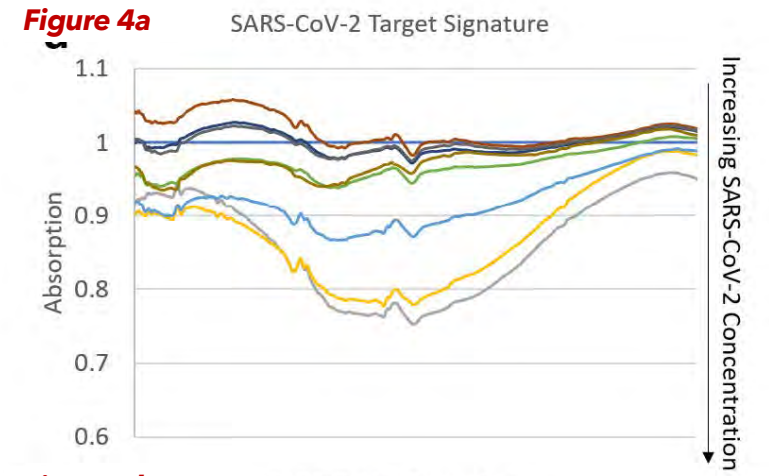




## Evidence (continued)

Figure 4: (a) Absorbance of SARS-CoV-2 virus strain from Hong Kong diluted in human saliva. (b) Quantification of the absorbance signature of the SARS-CoV-2 virus reveals a correlation between the virus absorption value and the virus concentration. This data shows that this virus is detectable down to 105 particles. This virus was provided by Microbiologics Inc. at a concentration of  $7.8 \times 10^9$  (Hong Kong) viral copies per milliliter.

These results show definitive evidence of FLASH-M's ability to differentiate between measurements of the virus and the background medium samples, including saliva. FLASH-M has shown an ability to detect and quantify viral concentration to as low as  $7.8 \times 10^5$  particles. Through these results, FLASH-M has demonstrated an ability to identify, quantify and classify SARS-CoV-2 in a human saliva sample. Thus, FLASH-M could be invaluable in SARS-CoV-2 early detection, screening, and contact tracing through simultaneous strain classification. Further FLASH-M efficacy and screen trial results may be provided by appropriate appendix.





- FLASH-M applies to ALL Civilian Population Centers, schools, industry, airports, aircraft, other transportation, food service, entertainment, open venues, medical facilities, first responders.
- FLASH-M provides REAL-TIME Passive Screening and Detection for SARS-nCoV-2 COVID-19 and H1N1 with ability to upload real time analytics to a secure CLOUD to determine the Population Health Readiness in REAL-TIME.
- FLASH-M is self-funded. Working with OSD DIU and Assistant Deputy SECDEF, tasked with proving FLASH-M can screen and detect SARS-nCoV-2 COVID-19 and H1N1 in REAL-TIME. FLASH-M can screen and detect the different strains of the biologic threat.
- FLASH-M screens and detects in Real-Time the biological threats with SOFTWARE and SENSOR.





- Clinical testing of FLASH-M conducted in real world conditions utilizing SARS-nCoV-2 COVID-19 and H1N1 reference samples provided to HNU Photonics by Microbiologics, the same company providing all BSL-3 grown SARS-nCoV-2 COVID-19 reference samples to DOD Operation Warp Speed.
- FLASH-M is ready for IMMEDIATE TRIAL DEPLOYMENT FOR Millennium Technologies.
- HNU Photonics SCORPIO V can ramp 4,000-6,000 FLASH-M systems per month. We can ramp any number of units required by utilizing the President's Defense Authorization for a National Emergency utilizing Defense Contractors we have aligned as OEM Partners.



- We have secured UNLIMITED volume of US Government approved laptop computers through DELL Federal as an OEM partner for FLASH-M ramp and deployment.
- FLASH-M is FDA EXEMPT. We are the same category as thermometers, microscopes, and cameras.
- FLASH-M is not treating patients, it is not a medical device, nor does it introduce any energy into the person or surface or material being screened.
- FLASH-M is a PASSIVE ACCESS CONTROL REAL-TIME SCREENING TECHNOLOGY
- FLASH-M is a COTS item.
- FLASH-M technology is based on each Real-Time screening session charge as software as a service. No reagents or chemicals required-all passive with software and Real-Time sensor.



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