

Member Update

NAATBatt Annual Meeting
March 13, 2019

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WE MAKE BATTERIES WORK

**Testing &
Certification**

**Battery
Applications**

**Research &
Development**

EAI Overview

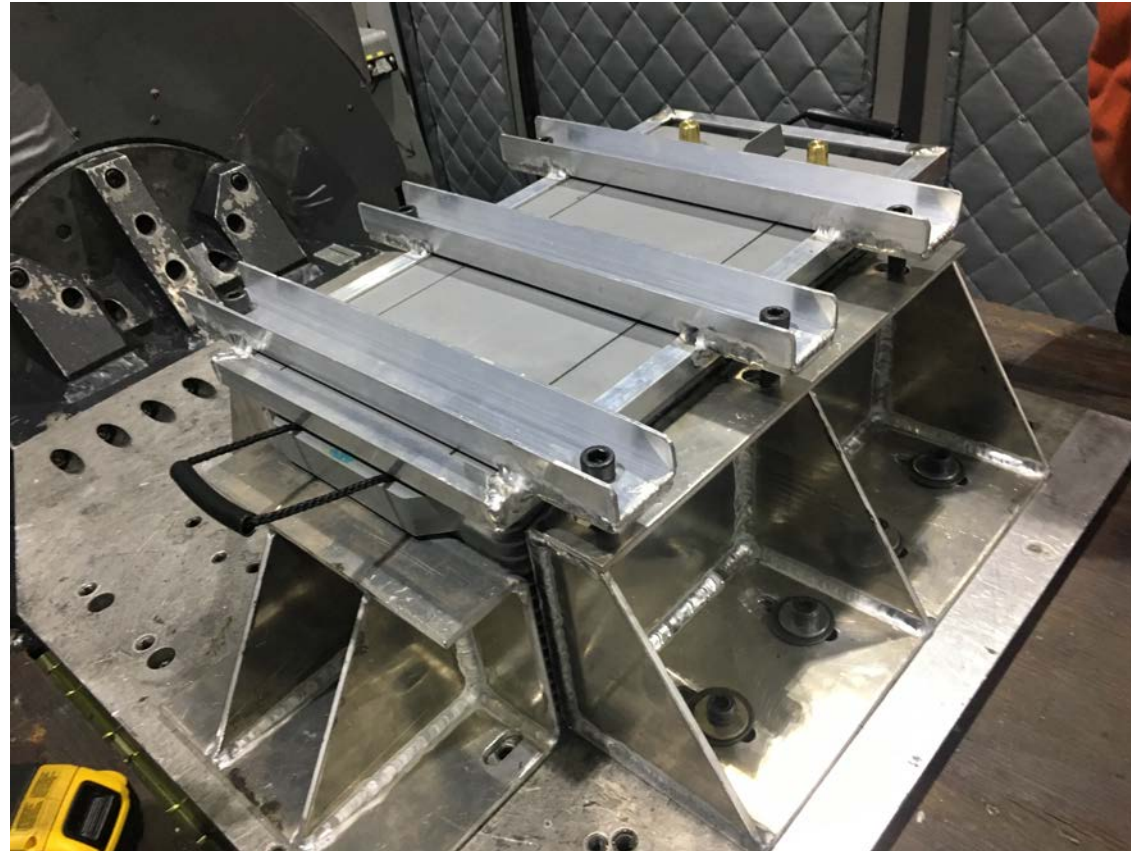
High Power Test Capability

- Reserve battery testing
- Traction life cycle testing
- 2 Channels
 - 750 VDC
 - 300 kW
 - 1,000 A



Application Testing

- Multiple Chemistries
 - Carbon
 - Lead
 - Lithium
 - Nickel
 - Sodium
- Abuse Testing
- Vibration Testing



+ National Lab Collaboration



SYNCHROTRON X-RAYS

Revisiting lead batteries with modern tools

Synchrotrons = particle accelerators that generate x-rays

- Higher energy = *real conditions*
- Higher flux = *real time*
- Higher resolution = *real complexity*

Advanced Photon Source (APS),
Argonne National Laboratory



Pack level (mm)

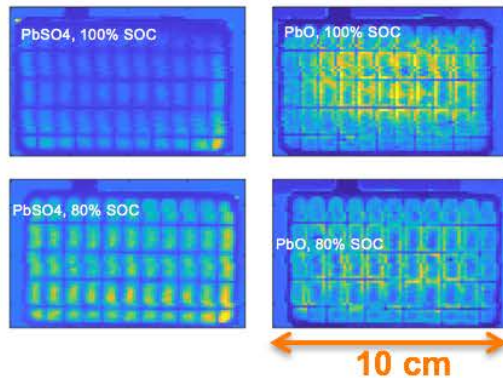


Particle level (μm)

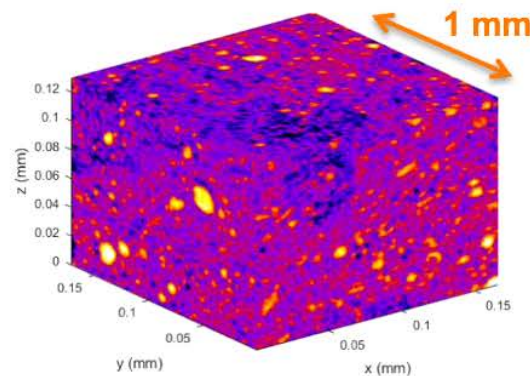


Atomic level (nm)

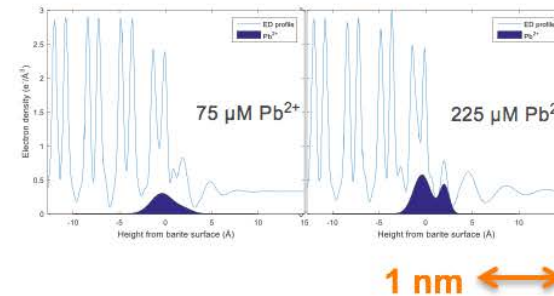
Example: XRD from motorcycle battery plates



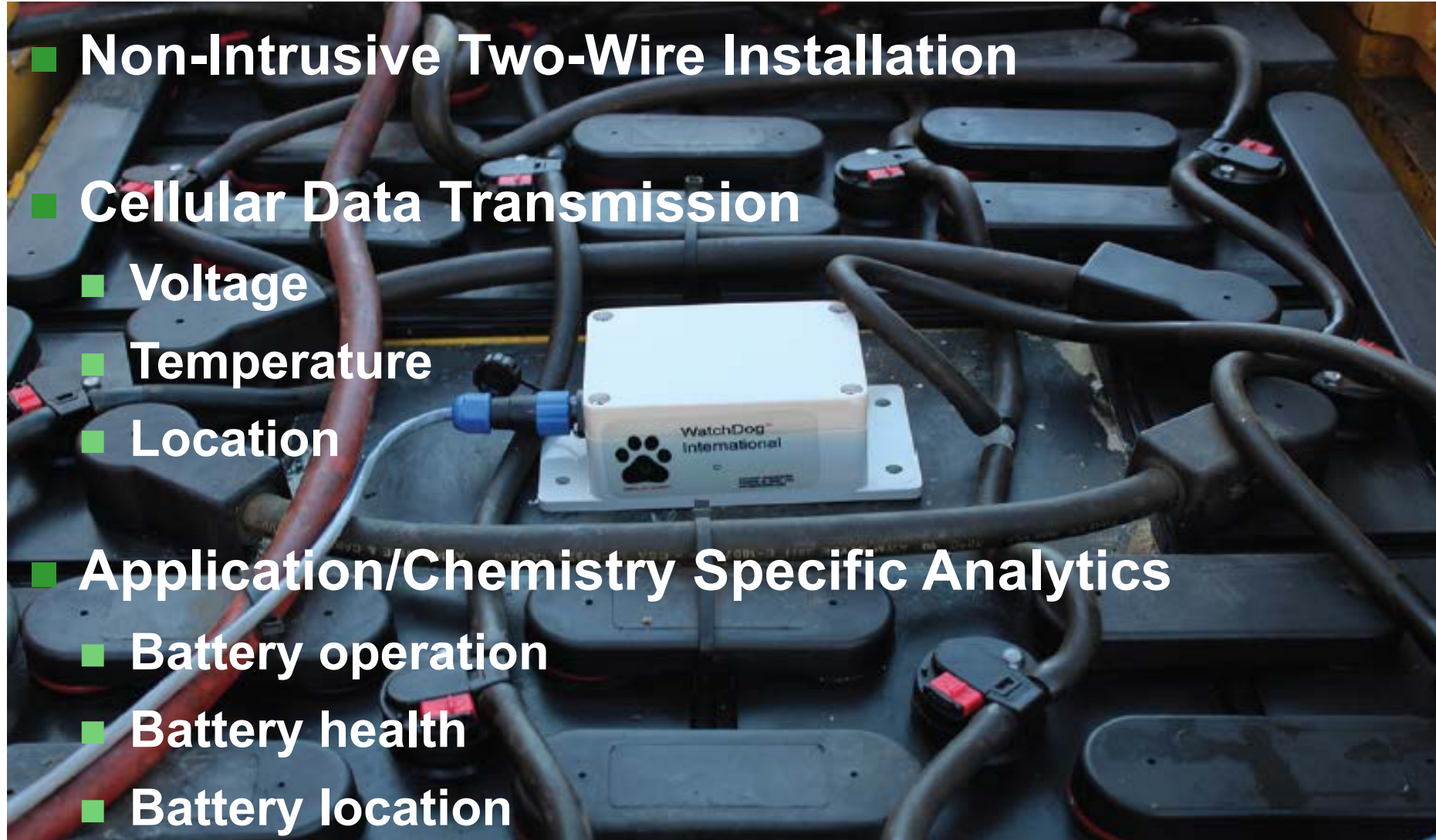
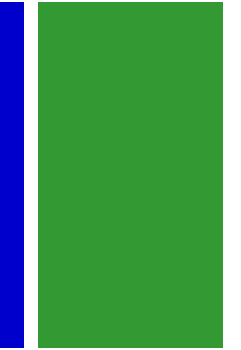
Example: CT scan of a paste electrode



Example: surface diffraction of lead adsorption and incorporation on BaSO_4 surface



WatchDog Battery Intelligence



- Non-Intrusive Two-Wire Installation
- Cellular Data Transmission
 - Voltage
 - Temperature
 - Location
- Application/Chemistry Specific Analytics
 - Battery operation
 - Battery health
 - Battery location



WatchDog®
International

Thanks !



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