SYSTEM AND PROCESS ASSESSMENT RESEARCH LABORATORY

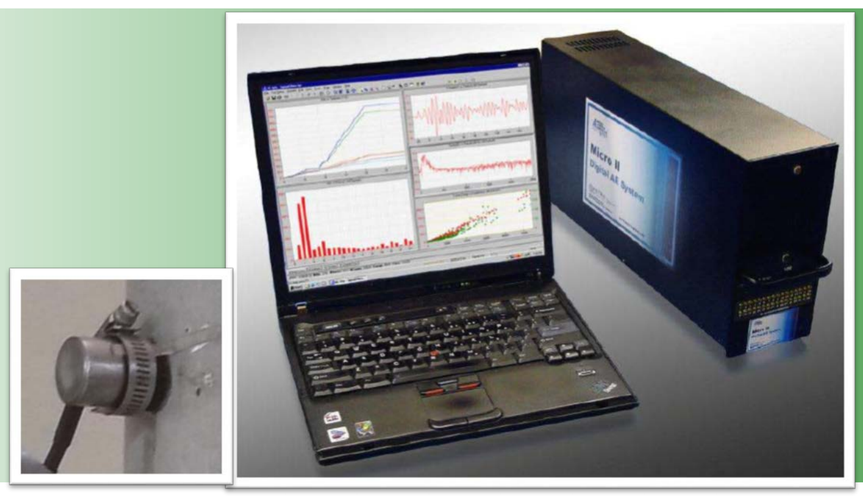
SPAR Lab

MISSOURI S&T

SAMOS MICRO II 24-CHANNEL ACOUSTIC EMISSION SYSTEM

Description of Equipment

- 3×8 channel peripheral component interconnect (PCI) cards installed in a stand alone PC
- 16 low frequency and 8 medium frequency sensors
- Post processing software (AEWin Suite and Aerosis)

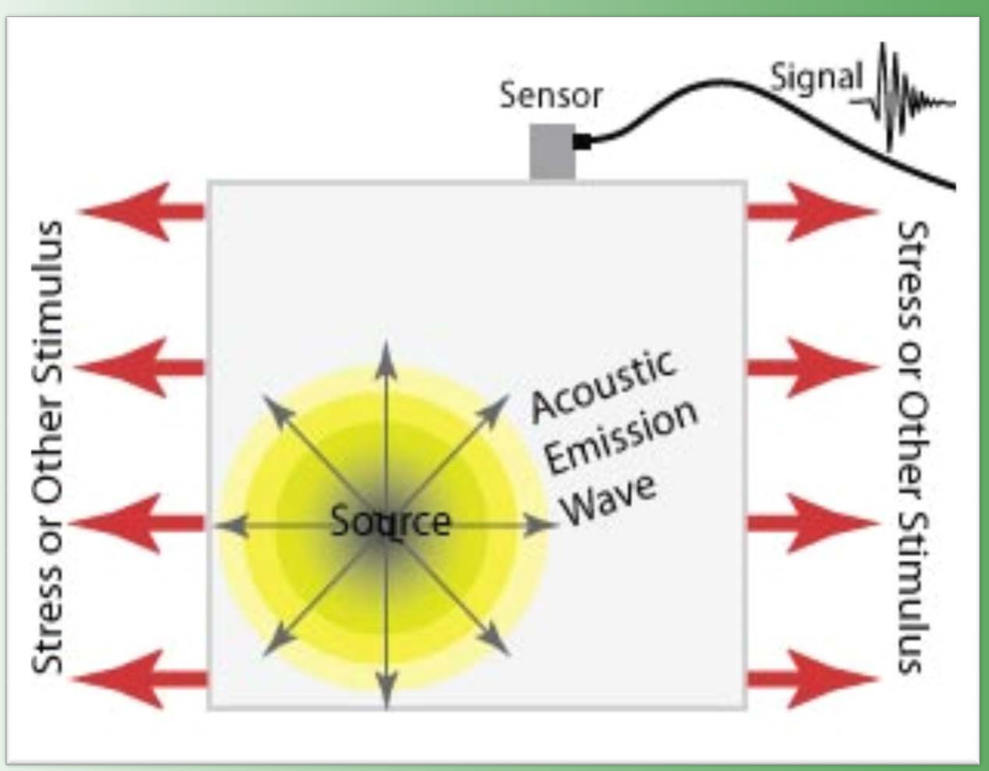


Procedure of Operation

- Mount sensors on area of interest with a coupling agent (vacuum grease). Brackets or tapes can be used to fix them.
- Start AEWin software, input acoustic emission timing parameters and create real time graphical readouts.
- Break a pencil lead on the surface of a specimen and adjust input parameters as needed. Location capabilities can be calibrated by adjusting material characteristics.
- Conduct experiment and observe results in real time. Adjust input parameters as needed to reduce noise. Incorporating “guard” sensors may be necessary for more accurate results.

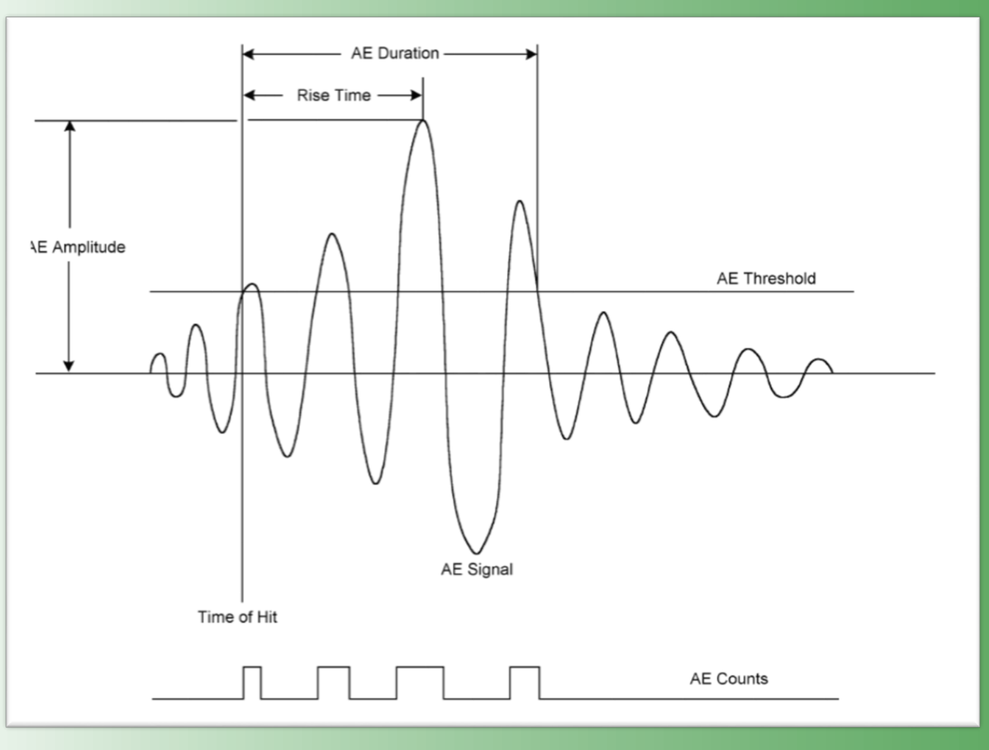
Main Benefits

- AE is a viable method for both long term and short term monitoring of a structure’s behavior.
- With a proper sensor setup and accurate location parameters, it is possible to determine the location of a material failure within a structural member.
- Recorded sounds can be linked to a physical event to help researchers identify the type of physical disturbance.



AE Parameters

- Amplitude: the maximum signal excursion during a Hit.
- Rise Time: the time defined between the start and the peak amplitude of an AE Hit.
- Detection Threshold: an amplitude trigger for the recording of a signal, one way to filter unwanted signals.
- AE Duration: the length of a recorded signal (millisec)
- Counts: number of times that the AE signal crosses the detection threshold
- Event: a local material change giving rise to an AE
- Guard Sensor: a sensor deployed to minimize extraneous noise based on arrival times of produced signals



Contact: *Genda Chen, Ph.D., P.E., SPAR Lab Director,* **Phone: (573) 341-4462, Email: gchen@mst.edu**