

Location Experiment on Concrete

Experiment Setup

Four AE sensors that have operation frequency between 100-400 kHz and resonance frequency at 200 kHz) were mounted on a concrete beam with distance of 0.5m between each other (see Figure 1). External preamplifiers with 60dB gain were used for amplification of AE signals. All four sensors with preamplifiers were connected to AE multi channel device for data measurement. Pencil lead break was used as a source of acoustic emission signals. Six lead breaks were initiated in 11 different locations and the waveforms were recorded on the AE device. The coordinates of the sensors are given in Table 1 and sources in Table 2.



Figure 1. Picture of experiment setup and source location.

Table 1. Sensor location coordinates.

	X Coordinate (m)	Y Coordinate (m)
Sensor 1	0	0
Sensor 2	0.5	0
Sensor 3	1	0
Sensor 4	1.5	0

Table2. Source location coordinates.

	X Coordinate (m)	Y Coordinate (m)	Folder Name
Source at sensor 1	0	0	Location at sensor 1
Source at sensor 2	0.5	0	Location at sensor 2
Source at sensor 3	1	0	Location at sensor 3
Source at sensor 4	1.5	0	Location at sensor 4
Source 1	0.125	0	Location 1
Source 2	0.25	0	Location 2
Source 3	0.375	0	Location 3
Source 4	1.125	0	Location 4
Source 5	1.25	0	Location 5
Source 6	1.375	0	Location 6
Source 7	1.75	0	Location 7

Hardware Setup

The hardware setup used for the experiments is shown in Table 3:

Table 3. Hardware Setup.

Threshold	Analog Filter		Waveform Setup		
	Lower	Upper	Sampling Rate	Pre-Trigger	Waveform Length
30dB	20 kHz	400 kHz.	2MSPS	256 μ s	15K