Simultaneous Detection and Classification of Acoustic Emissions in Integrated Diagnostics with Yield in Aluminum[1] DEVENDRA PARMAR, Hampton University, Hampton, VA 23608, HAMPTON UNIVERSITY TRANSPORTATION CENTER TEAM — Acoustic emission (AE) experiments were conducted on a strained aluminum (10 cm x 9 cm x 0.25 cm) specimen. Studies were conducted with the goal to characterize AE associated with material yield developed due to high loading and to correlate the course of the yield with AE signals. The American Association of State Highway and Transport Officials (AASHTO) listed aluminum as one of the structural components of highway brides[1]with unit weight of 2800 kg.m^{-3}. The specimen, mounted on the load frame, was held on each end by the wedge grips and was electromechanically tested in a tension mode at rates of extension of 0.0333 mm/s and 0.0666 mm/s. Load was applied to the test frame via moving cross heads. A load transducer (load cell) mounted in series with the specimen measured the applied load by converting it into an electrical signal. Results are analyzed using defect zone model in which location of the defect is determined from the measurement of the arrival time of the signal at two different sensors placed at strategically around the source of emission from the test object. The sensor that detects the signal first is identified to be in the defect zone. [1]AASHTO LRFD Bridge Design Specifications, 1994.

Devendra Parmar
Hampton University, Hampton, VA 23608

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