

1.3.21. AN SH WAVE ARRAY FOR ULTRASONIC CRACK MONITORING AT HIGH TEMPERATURES (>500°C)

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The development of shear horizontal (SH) wave transducers that can work at high temperatures (>500°C) has opened up the possibility to carry out ultrasonic monitoring using SH waves at elevated temperatures on running plants. The deployment of such monitoring devices can provide substantial economic benefit by continuously supplying information about the state of a critical plant component rather than only at periods of shut down, which can be years apart. This paper presents simulation and experimental results from an array of SH probes on several thick notched plates. A purpose built array controller was used to acquire signals from the notched specimens. Then images of the defects were processed using a variation of the total focusing method (TFM). Using the prototype system, images of thick plates with notches of varying depth were acquired at room temperature. The size of the defect in the processed image corresponded well to the actual size of the notches. Further experiments on two samples containing fatigue cracks showed that the technique also works on real life defects. Finally a notched plate was placed in a furnace and images of the notch were acquired at elevated temperatures.