

## **MASW SURVEYS WITH MULTIPLE IMPACTS AT MULTIPLE OFFSETS (MIMO)**

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The near-field effect of surface-wave propagation dictates that the distance between the source and the nearest receiver, a distance commonly called source offset ( $X_1$ ), should be set in proportion to the wavelength ( $\lambda$ ) of surface waves being measured;  $X_1 = a\lambda$  with, for example,  $a = 0.5$ . However, during an MASW survey that requires a simultaneous measurement of a broad range of wavelengths, one constant source offset is commonly used as a compromise. Collecting multiple MASW data sets by using multiple source offsets will constitute a significant challenge from both field operation and subsequent data analysis perspectives. A simple approach is introduced that allows multiple impacts (MI) at multiple offsets (MO) during a recording time that is longer than the time normally used for an active MASW survey. For example, a recording time of 15 seconds or longer is used to acquire one field file, during which multiple impacts are applied at different offsets from the nearest receiver as the hammer man walks away from (or into) the receiver array along the linear extension of the receiver array. The subsequent data analysis will separately process surface waves from different impacts to generate separate dispersion images, all of which will then be stacked to produce one final dispersion image that can delineate dispersion properties over a broad range of frequencies (wavelengths). This approach can maximize the accuracy of MASW surveys at both shallow and deep depths with a given length of receiver array at the minimum field operation cost.