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Unreported seismic events found far off-shore Mexico using full-waveform, cross-correlation detection method.

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A large subset of seismic events do not have impulsive arrivals, such as low frequency events in volcanoes, earthquakes in the shallow part of the subduction interface and further down dip from the traditional seismogenic part, glacial events, volcanic and non-volcanic tremors and landslides. A suite of methods can be used to detect these non-impulsive events. One of this methods is the full-waveform detection based on time reversal methods (Solano, et al , submitted to GJI). The method uses continuous observed seismograms, together with Greens functions and moment tensor responses calculated for an arbitrary 3D structure. This method was applied to the 2012 Ometepec-Pinotepa Nacional earthquake sequence in Guerrero, Mexico. During the span time of the study, we encountered three previously unknown events. One of this events was an impulsive earthquake in the Ometepec area, that only has clear arrivals on three stations and was therefore not located and reported by the SSN. The other two events are previously undetected events, very depleted in high frequencies, that occurred far outside the search area. A very rough estimate gives the location of this two events in the portion of the East Pacific Rise around 9 N. These two events are detected despite their distance from the search area, due to favorable move-out on the array of the Mexican National Seismological Service network (SSN). We are expanding the study area to the EPR and to a larger period of time, with the objective of finding more events in that region. We will present an analysis of the newly detected events, as well as any further findings at the meeting.