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Deep linear ultrasonic sensor array observation for particle migration related with tectonic movements; A proposal for tsunami early warning

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Recent tsunami warning systems has equipped with vertically placed point-transducers for measuring surface level of water. However, they are capable for secondary or more after current stages of changing water mass directions by driven tectonic forces. Secondly, they are efficient on continent shelves about increasing wave-amplitude and stuck mass of water. Atmospheric pressure and wind velocity measurements provide auxiliary correction for eliminate wrong alerts. Deep ocean bed and sediment-water interface area is one of the best observational zone about primary water currents due to fault movements. Reverse or normal fault mechanism earthquakes may give only a short time for tsunami escape even with the help of coastal tsunami alert centres. However, we can save more time with observation of suspended or semi-placed particles at the oceanic-bed with parallel-array sensors, which are more efficient than a single transducer during an earthquake or any slow deformation stage of basin. Because one or more far transducers cannot be able to get information about particle dimensions and density clouds, for example, how fast they are at low velocities (e.g. in the order of 1 mm per second) during acceleration of water masses under tectonic forces. At faster velocities, linear-array transducer series are more efficient since they are even sensitive to their neighbour-sensor scanning areas. Because triangular scanning area of an individual sensor expands to its neighbour areas and it receives sound-beam reflections coming back from the same particle. Homogenously separated piezo-crystal structure provides a hammer effect with less trigger-energy under high-pressure. The experiences about high velocity (up to 1 m per second) and very-close particle observations were successful at a close-water circuit prepared by using 5 cm diameter pipe-pomp system. Observation supports earthquake early warning variety work about concentration of radon gas, free ions, magnetic field and its electric potential. On the other side, it will provide future information about critical particle velocity, how it changes before or after an earthquake occurring at a deep deforming-basin.