

Detection of Active Scatterers: --ACROSS with super arrays in monitoring and modelling--

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Temporal variation of the "scattering sources" due to the structure sensitivity is an essential characteristics of the "Active Scatterers". The active scatterers are characteristically similar to those of active faults that intermittently cause earthquakes and/or slip events. Observable phenomena that cause temporal variations of stress field related to generations of earthquakes and volcanic eruptions could be mainly reflected seismic and/or electromagnetic waves from the "active scatterers". The heterogeneity in the lithosphere originated from both stress state and heterogeneous distribution of fluid included rocks can be the "scattering sources". The active geophysical monitoring would be the essential tool to detect and clarify such an evolving process that governed by the "structure sensitivity". Among many structure sensitive phenomena, probable changes in the reflected seismic or electromagnetic signals are expected in the temporal variations of impedance and anisotropic dispersion of the transmitted signals in the subduction zone where the "scattering sources" are evolving associated with the movement of the fluid mainly composed of supercritical water in the crust and upper mantle conditions. Recently discovered slow slip events and deep non-volcanic tremors are believed to be caused by the movement of water vapor (or the fluid mainly composed of supercritical water) supplied by the dehydration of the subducted material, although the mechanisms to generate these phenomena remain uncertain. Intermittent occurrence of these events could suggest that the stress conditions in the crust and upper mantle could be a critical state and triggered by the movements of water vapor.