Oldest Array (Pacific Array on the oldest seafloor), the first result

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With a simple crustal structure and short geological history, ocean basins provide an unblemished view into mantle dynamics, including convective flow and melting processes that control deformation and evolution of Earth’s surface. With the full spectrum of plate-boundary processes and abundant mid-plate volcanism sourced deep in the mantle, the Pacific basin provides an outstanding setting to explore connections between shallow dynamics and the deep interior. Exploiting advances in seafloor instrumentation, research groups in Japan, the US, and elsewhere have demonstrated the utility of broadband ocean-bottom seismic and EM arrays for providing new, high-resolution constraints on mantle structure and dynamics. These activities have coalesced into the international collaboration Pacific Array, which seeks to merge individual efforts into a large-scale "array of arrays" that will effectively cover the entire Pacific basin diachronously over a decadal time scale.

As a part of the Pacific Array initiative, a team comprised of scientists from Japan and South Korea has completed the Oldest Array observation on the oldest seafloor in the western Pacific. Oldest Array consists of 12-seismic and 7-EM array that was deployed in Oct-Nov, 2018, for a duration of 12 months, followed by a successfully recovered in Oct-Nov, 2019. The instruments and vessels are respectively provided by ERI and KIOST. The array covers the northwestern side of the ~170Ma old magnetic lineation triangle aiming to delineate the lithosphere-asthenosphere system beneath the oldest Pacific basin to elucidate the enigma of seafloor flattening, as well as the dynamics of the birth of Pacific plate. The initial look at data indicates beautiful recordings, and we plan to report the first analysis results at the meeting.