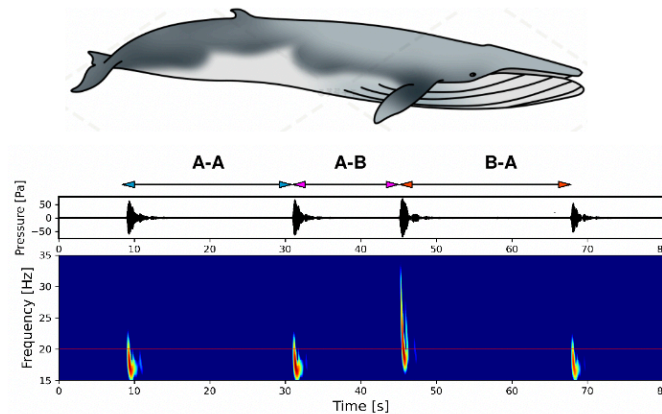


## FIN WHALES AROUND THE SOUTHERN WAKE ISLAND: STORIES FROM HYDROACOUSTIC DECIPHERING OF THEIR VOICES

**Dr. LIANXING WEN**

Professor, Department of Geosciences



November 22, 2024, 7:30pm, Earth & Space Sciences 001

Fin whales (*Balaenoptera physalus*), a cetacean with an estimated population of 10,000, were assessed as a vulnerable species by the International Union for Conservation of Nature. Fin whales make calls and generate hydroacoustic signals propagating through the ocean. Deciphering the recorded hydroacoustic signals becomes a primary tool to study the living habits of fin whale, including submerging, surfacing, moving, and migration in different oceans. The progress of fin whale study however is hindered by the debate on whether the two typical type-A and type-B fin whale calls originate from a single fin whale with two distinct voice spectra or two individual fin whales of different voice spectra. In this presentation, we resolve the debate and study fin whale behaviors around the Southern Wake Island from 2010 to 2022, using the hydroacoustic data recorded by a hydrophone network operated by the Comprehensive Nuclear Test Ban Treaty Organization. It is identified that type-A and type-B calls come from two individual fin whales based on the large source separation of the two calls through high-precision determination of their source locations. With that identification, we report vocal influence, culture transmission and population change of fin whales in the region.



Professor Wen is a theoretical and observational seismologist and geodynamicist. He uses seismic waves to probe the internal structure of the Earth and its change with time, combines seismic and mineral physics data to constrain the composition of the mantle, and develops geodynamical models of how Earth's internal processes govern the Earth's continental drift, surface uplift, surface large igneous province, geochemistry, intra-plate deformation and volcanism. Professor Wen is a recipient of the James B. Macelwane Medal from the American Geophysical Union (AGU) and a fellow of the Union. Macelwane Medal honors "significant contributions to the geophysical sciences by a young scientist of outstanding ability" and AGU fellowship is a designation conferred upon not more than 0.1% of all AGU members in any given year.