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 [JJ] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-OS Ocean Sciences & Ocean Environment

## [A-OS15] Dynamics of oceanic and atmospheric waves, vortices, and circulations

convener: Ryo Furue (APL/JAMSTEC), Yuki Tanaka (Graduate School of Science, The University of Tokyo), Yukiharu Hisaki (琉球大学, 共同), Norihiko Sugimoto (Keio University, Department of Physics)

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Oceanic and atmospheric dynamics aims at abstracting general principles from observed phenomena and constructing a system of mathematical models, thereby leading to the understanding, prediction, and parameterization of those phenomena. It provides perspectives for the advancement of sciences in various areas such as wind waves, swells, internal waves, Rossby waves, equatorial waves, tides, eddies, meandering of jets and fronts, general circulation, boundary layers, and ocean-atmosphere coupled modes. It has also been and will continue to be benefited by new uses of ideas and methods from such theories as resonance, nonlinear interaction, spectral analysis, probability, statistics, and dynamical systems. In this session, we solicit presentations on observational, experimental, numerical, and theoretical studies of oceanic and atmospheric dynamics and on exploratory use of new ideas and methods. We also welcome presentations on new methods of data analysis and on interdisciplinary studies in fields such as climate and environment.

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## [AOS15-P04] Hypothesis of Dynamics of Water Exchange between the Sea of Okhotsk and the Pacific from a point of view of Tidal Effects

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Island Rule and East Kamchatka Current (EKC) driven mechanism are theories for explaining the exchange system between the Sea of Okhotsk and the Pacific. However, the volume transportation estimated by Island Rule is 1 order greater than observation data by previous reports. Besides, EKC driven mechanism cannot fully explain the situation which is without a significant flow direction either.

Since tidal forcing is also an important component for ocean dynamics, we tested the situation with tidal forcing as a control run. Numerical results from an ocean general circulation model COCO presents that the appearance of tidal effects dominates presence or absence of the net through flow. Further, tidal forcing contributes both barotropic and baroclinic components after separating these two components out. The velocity anomaly results show that the western boundary current turns the direction to the island chain when it flows above a sea-mountain in tidal case. Because of the change of flowing direction of the western boundary current, EKC driven mechanism can be established when the friction stress is gained in east side of Island chain. Therefore, we hypothesize the interaction between western boundary current and tidal forced topographic trapped wave is required in barotropic components exchange system in this model. Besides, the two-channels water exchange system driven by density gradient is also hypothesized for baroclinic component.