	The	Most	Importa	nt Results
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of the Laboratory of Nonlinear Dynamical Systems (since 2014)

Заведующий лаборатории - профессор С.В. Пранц удостоен Международной премии им. Г. Заславского по нелинейной науке. Prof. S.V. Prants is the winner of an International Zaslavsky Award in nonlinear science and complexity.

По итогам голосования на ученом совете ТОИ результат лаборатории был признан важнейшим в ТОИ и включен в число важнейших результатов РАН в 2014 г.

Лагранжево моделирование приповерхностного переноса во фронтальной зоне Куросио-Ойясио после аварии на АЭС «Фукусима-Дай-ичи»

2014

Prof. S.V. Prants is the winner of an **International Zaslavsky Award** in nonlinear science and complexity.

According to voting at the Institute Scientific Council, the following result was recognized as the most important one in the Institute and included among **the most important results** in the Russian Academy of Sciences in **2014**

2014

<u>Lagrangian simulation of near-surface transport in the Kuroshio-Oyashio frontal zone</u> <u>after the Fukushima accident >></u>



Our results on applications of Lyapunov exponents in quantifying transport and mixing in the ocean, searching for mesoscale eddies with a risk to be contaminated by the Fukushima derived radionuclides, and indentifying Lagrangian fronts favorable for fishery were posted at the AVISO site http://aviso.altimetry.fr/index.php?id=3160

According to voting at the Institute Scientific Council, the following result was recognized as the most important one in the Institute in 2015

<u>Three dimensional Lagrangian analysis of the vertical structure of deep-sea eddies in the Japan Basin of the Japan Sea >> </u>

2016

According to voting at the Institute Scientific Council, the following result was recognized as **the most important one in the Institute**in 2016

<u>Lagrangian analysis of formation, structure, evolution and splitting of Kuril</u> eddies : &qt:&qt:

The Laboratory of Nonlinear Dynamic Systems (head. Lab - Prants S.V.) was one of the main organizers of the international conference "Vortices and Coherent Structures: From Ocean to Microfluids"

http://vcs.poi.dvo.ru/, which successfully passed Vladivostok in the Pacific Oceanological Institute. V.I. Illicheva of the Far East Branch of the Russian Academy of Sciences from 28 to 31 August 2017

According to voting at the Institute Scientific Council, the following result was recognized as the most important one in the Institute in 2017

Lagrangian oceanography

The book summarizes our 15 years work on developing a new Lagrangian approach to study transport and mixing in the ocean. It starts with chapters where we describe dynamical systems theory methods for description of chaotic mixing and transport in idealistic vortex and jet flows. Then the developed methods, based on computing different Lagrangian indicators in altimetric and numerically-derived velocity fields, are applied to different phenomena in the real ocean including mesoscale eddies, meandering jet currents, fronts, etc. It is shown how to identify in the AVISO velocity field daily locations of Lagrangian fronts defined as boundaries between waters with strongly different Lagrangian properties. It is statistically shown that these fronts may serve as proxy indicators of increased bioproductivity and potential fishing grounds. The developed methodology is also applied to simulate, identify and track the mesoscale eddies which have been sampled in the cruises after the Fukushima accident on March 11, 2011 and to estimate their risk to be contaminated by Fukushima-derived radionuclides. The simulated results are validated with in situ shipboard measurements, SST images, tracks of drifters and Argo floats.

According to voting at the Institute Scientific Council, the following result was recognized as **the most important one in the Institute**in 2017

<u>Lagrangian oceanography >>> </u>

Three fellows, M.V. Budyansky, S.V. Prants and M.Yu. Uleysky, are among the most cited Russian scientists

http://w
ww.expertcorps.ru/science/whoiswho/by city/59

According to voting at the Institute Scientific Council, the following result was recognized as the most important one in the Institute
in 2018

How eddies gain, retain and release water >>>

2020

According to voting at the Institute Scientific Council, the following result was recognized as the most important one in the Institute in 2020

<u>Lagrangian analysis of Kamchatka trench eddies</u> <u>>></u>

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According to voting at the Institute Scientific Council, the following result was recognized as:

the
most important one in the Institute
in 2021

Lagrangian fronts as a predictor of locations for saury fishing >>>

2022

According to voting at the Institute Scientific Council, the following result was recognized as the most important one in the Institute **in 2022** and was included in the list of the most important results of the Earth Science Department of the Russian Academy of Sciences «Water masses favorable for living and catching pollock in the Sea of Okhotsk: calculation, Lagrangian and statistical analyses, recommendations for fishermen»

Water masses favorable for living and catching pollock in the Sea of Okhotsk: calculation, Lagrangian and statistical analyses, recommendations for fishermen >>