

## Publications–Resonant Interactions of Water Waves with Vorticity-P 30878 N32

- (1) C. I. Martin and B. Basu. *Resonances for water waves over flows with piecewise constant vorticity*, **Nonlinear Analysis: Real World Applications**, 57 (2021), 103176.
- (2) C.-I. Martin. *Geophysical water flows with constant vorticity and centripetal terms*, **Annali di Matematica Pura ed Applicata**, 200 (2021) no. 1, 101-116.
- (3) C. I. Martin. *Some explicit solutions to the three-dimensional nonlinear water wave problem*, **J. Math. Fluid Mech.** 23 (2021), no. 2, Art. 33.
- (4) B. Basu and C. I. Martin *Capillary-Gravity Water Waves: Modified Flow Force Formulation*, **J. Differential Equations**, 269 (2020), no. 12, 11231-11251.
- (5) D. Henry and C.-I. Martin. *Stratified equatorial flows in cylindrical coordinates*, **Nonlinearity**. 33 (2020) no. 8, 3889-3904.
- (6) C.-I. Martin and R. Quirchmayr. *A model for the Antarctic Circumpolar Current with eddy viscosity and variable density*, **Monatshefte Math.** 192 (2020) no. 2, 401-407.
- (7) C. I. Martin and A. Petrusel. *A fixed-point approach for azimuthal equatorial ocean flows*, **Applicable Analysis** <https://doi.org/10.1080/00036811.2020.1736288>.
- (8) R. I. Ivanov and C.-I. Martin. *On the time-evolution of resonant triads in rotational capillary-gravity water waves*, **Physics of Fluids** 31 (2019) no. 11, 117103.
- (9) C.-I. Martin and R. Quirchmayr. *Explicit and exact solutions concerning the Antarctic Circumpolar Current with variable density in spherical coordinates*, **J. Math. Phys.** 60 (2019) no. 10, 101505.
- (10) C. I. Martin. *Constant vorticity water flows with full Coriolis term*, **Nonlinearity** 32 (2019) no. 7, 2327-2336.
- (11) C. I. Martin and A. Rodriguez-Sanjurjo. *Dispersion relations for steady periodic water waves of fixed mean-depth with two rotational layers*, **Discrete Contin. Dyn. Syst. A** 39 (2019) no. 9, 5149-5169.

### Obtained Results

- i) Derivation in [3] of **explicit solutions to the time-dependent three-dimensional water wave problem**.
- ii) **Rigidity-type results for three-dimensional water flows** with (constant) vorticity. More precisely, in [2] and [10] were obtained results on how a constant vorticity vector determines the dimensionality of water flows with and without Coriolis effects.
- iii) Derivation of **explicit and exact solutions** describing geophysical water flows which exhibit general (continuous) **stratification** [5,6,7,9].
- iv) Study an effect of the **resonant interaction of three distinct modes in the case of one-directional propagation of capillary-gravity surface waves** in a rotational water flow. More precisely, we obtained in [8] **dynamic equations for a resonant triad**.
- v) Derivation in [1] of a **flow force formulation for capillary-gravity water waves with free surface**. This was utilized to prove the local existence of waves of small amplitude over a flow allowing the presence of stagnation points.