Emile Deléage

Personal info

Date of birth September 1998

Nationality French

Current Position

2025- Postdoc at LJK, Grenoble - Mathematical analysis of ocean/atmosphere coupling models - Under the supervision of Eric Blayo, Didier Bresch, Anne-Laure Dalibard and Florian Lemarie.

Education

2022-2025 PhD student at Institut de Mathématiques de Marseille and INRAE Grenoble - Modelling and Mathematical Analysis of complex gravity flow - Under the supervision of Charlotte Perrin and Thierry Faug.

2022 Internship at IMPA (Rio de Janeiro) under the supervision of Felipe Linares

2021 Internship at LPENSL (Lyon) under the supervision of Antoine Venaille

2018-2022 Student at ENS de Lyon

2019-2021 Master Mathématiques Avancées - Équations aux Dérivées Partielles, Université Claude Bernard (Lyon)

2018-2019 Licence Mathématiques Fondamentales, Université Claude Bernard (Lyon)

Research interests

Partial differential equations applied to fluid mechanics

Modeling: granular flows, multiphase flows, climate models

Nonlinear hyperbolic equations, dispersive equations

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Preprints

2026 **Regularisation and validation of a depth-averaged model for granular flow consistent with the incompressible $\mu(I)$ rheology**, with Gaël Loïc Richard (HAL)

Publications

2025 **Stability of partially congested travelling wave solutions for the extended Aw-Rascle system**, with Muhammed Ali Mehmood, in *Journal of Mathematical Fluid Mechanics*, 2025, 28(1), 6 (HAL)

2025 **Hyperbolicity study of models for turbulent two-phase flows obtained from the variational principle**, in *Communications in Mathematical Sciences*, 2025, 23 (6), pp.1631-1668 (HAL)

2025 **A depth-averaged model for granular flow consistent with the incompressible $\mu(I)$ rheology**, with Gaël Loïc Richard, in *Journal of Fluid Mechanics*, 1009 (2025): A57 (HAL)

2024 **Well-posedness of Reynolds averaged equations for compressible fluids with a vanishing pressure**, in *Mathematical Methods in the Applied Sciences* 47 (2024), 817-824, DOI 10.1002/mma.9685 (HAL)

2023 **Well-posedness for the initial value problem associated to the Zakharov–Kuznetsov (ZK) equation in asymmetric spaces.** With Felipe Linares, in *SN Partial Differential Equations and Applications*, 2023, 4 (2), pp.9. ⟨10.1007/s42985-023-00223-5⟩ (HAL)

Scientific communications

2025 Workshop on compressible multiphase flows, Strasbourg (oral presentation)

2025 Séminaire EDPs^2, Chambéry (oral presentation)

2025 Séminaire ACSIOM, Montpellier (oral presentation)

2024 Congrès des Jeunes Chercheur.e.s en Mathématiques Appliquées, Lyon (oral presentation)

2024 Workshop on compressible multiphase flows, Strasbourg (poster)

2024 CANUM, Île de Ré (poster)

2024 Lancement de l'ANR Bourgeons, Paris (poster)

2023 Junior Analysis Seminar, Imperial College London (oral presentation)

2023 New Trends in Mathematical Fluid Dynamics, Grenoble (poster)

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Teaching

2023-2024 L3 Centrale Méditerranée, Analyse numérique (TD) 36h (iterative methods, polynomial approximation, numerical differentiation and integration, numerical methods for ODEs, finite differences method for PDEs)

2023-2024 L3 Centrale Méditerranée, Analyse théorique (TD) 24h (differential calculus, finite dimensional optimisation, Lebesgue integration, Fourier transform, Hilbert spaces)

PhD formations

2024 M2 course "Complex mechanics and granular matter" by Pierre Saramito and Didier Bresch

2024 Autumn school "Journées scientifiques 2024 du RT Terre et Énergies"

2023 M2 course "Waves in Continuum Media" by Sergey Gavrilyuk and Régis Cottereau

2023 Summer school "New trends in Mathematical Fluid Dynamics"

2022 École 2022 du GdR MathGeoPhy

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