Sophie Thery *Postdoc researcher in Applied Mathematics*

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Research Interests

I am interested in the analysis and the mathematical modeling of geophysical fluids, especially in the context of ocean, atmosphere and sea-ice applications. My two main areas of reasearch are the analysis of an non-local ocean and atmosphere coupling model and the water-waves interaction with the floating elastic and porous plate.

Research activities

2023 - 2025	**Postdoc- Applied Analysis**	
	Institute of Mathematics - University of Augsburg	
	Water-wave and floating structure interaction, modeling of sea-ice	
	Flexural gravity waves, floating elastic plates, wave scattering, porosity	

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Institute of Mathematics - University of Augsburg
Water-wave and floating structure interaction, modeling of sea-ice
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2021 - 2022 **Postdoc / Research Engineer**   SASIP Project
Laboratoire Jaques-Louis Lions, Sorbonne Université
Implementation of fracture in a granular model of sea-ice floes dynamics
Brittle fracture model, C++ implementation

2017 - 2021 **PhD in Applied Mathematics**   école doc. MSTII
Laboratoire Jean Kunztmann, Université de Grenoble
Numerical study of ocean-atmosphere coupling algorithms with boundary layer parameterizations.
Multiphysics coupling, turbulent parametrisation, Schwarz algorithm

Publications

- **Transformation-based cloaking for flexural–gravity waves in an anisotropic plate floating on shallow water**
  S.Thery, M. Peter, L. Bennetts, S. Guenneau (2024) - submitted

- **Well-posedness of a non local ocean-atmosphere coupling model: study of a 1D Ekman boundary layer problem with nonlocal KPP-type turbulent viscosity profile**
  S.Thery (2023) - submitted

- **On the links between observed and theoretical convergence rates for Schwarz waveform relaxation algorithm for the time-dependent problems**.
  S.Thery, Conference proceeding book Domain Decomposition Methods in Science and Engineering XXVI (2022).
  doi : 10.1007/978-3-030-95025-5_62

- **Analysis of Schwarz waveform relaxation for the coupled Ekman boundary layer problem with variable coefficients**
  S.Thery, C. Pelletier, F. Lemarié, E. Blayo. Numerical Algorithm (2021).
  doi : 10.1007/s11075-021-01149-y

Communications in conferences

- **Cloaking by thin plate in water waves**

  – S. Thery, M. Peter, WAVES - International Conference on Mathematical and Numerical Aspects of Wave Propagation, Berlin, Germany (2024), *Communication minisymposium*

– S. Thery, M.Peter, KOZWaves- Australasian conference on wave science. Dunedin, New Zeleand (2024), *Communication minisymposium*

- **Well-posedness of a non local ocean-atmosphere coupling model**
  S. Thery, CANUM, 46e Congrès National d'Analyse Numérique, Ile de Ré France (2024), *Communication minisymposium*

- **Ice floe fracture in a granular model**
  – S. Thery, CANUM, 45e Congrès National d'Analyse Numérique, Evian-les-bains France (2022), *Poster*
  – S. Thery, workshop SIPW05: Mathematics of sea ice in the twenty-first century, Cambridge (2022), *Poster*

- **Schwarz algorithms for ocean-atmosphere coupled problems including turbulent boundary layers parameterizations**
  S.Thery 26th International Conference on Domain Decomposition Methods, (2020) en ligne. *Communication minisymposium*

- **Algorithmes de Schwarz et conditions absorbantes pour le couplage océan atmosphère**
  S. Thery, CANUM, 44e Congrès National d'Analyse Numérique.
  France (2018),*Communication minisymposium*

Teaching

2023 - 2024	**Teacher Assistant for Master students, exercice classes**

Institute of Mathematics, University of Augsburg, Germany

- Computational Partial Differential Equations : Partial differential equation, finite element method (approx. 60h);
- Numerical Analysis of Multiscale Problems : finite element method for multiscale problems (approx. 60h)

2018 - 2021	**Teacher assistant for first year mathematic, physics and engineer students**

DLST, Université Grenoble Alpes

- practical session on software in statistics and scientific computing (approx. 100h);
- lectures and exercises class in analysis and applied mathematics (approx. 220h)

2018 - 2020	**Research and Teaching Label**
	Training on teaching methods and reflections on education and scientific research

Education

2015 - 2017	**Master Science in Industrial and Applied Mathematics**
	Université Grenoble Alpes
	Modeling, Scientific Computing, Image analysis, Statistics
2010 - 2014	**Licence Mathématiques Fondamentales**
	Université Joseph Fourier, Grenoble

Interships

2017	**Algorithmes de Schwarz pour le couplage océan-atmosphère**
	LJK, Université Grenoble Alpes
	Schwarz algorithm, Domain decomposition method
2016	**Numerical implementation of the undulator radiation at resonance and off-resonance**
	European Synchrotron Radiation Facility - Grenoble
	Scientific computing, electromagnetism