Wave turbulence of internal waves

Nicolas Mordant*[1,2,3]

[1]Laboratoire des écoulements géophysiques et industriels (LEGI) – Université Joseph Fourier - Grenoble I, Institut polytechnique de Grenoble (Grenoble INP), CNRS : UMR5519 – 1025 Rue de la piscine - BP 53 38041 GRENOBLE CEDEX 9, France

[2]Institut Universitaire de France (IUF) – Ministère de l'Enseignement Supérieur et de la Recherche Scientifique – Maison des Universités, 103 Boulevard Saint-Michel, 75005 Paris, France

[3]Université de Grenoble Alpes (UGA) – Universite de Grenoble Alpes – France

Abstract

Weak turbulence is a theory developed since the 60's as a statistical theory of wave turbulence, i.e. a turbulent state made of a large number of non linear waves. In the limit of weak non linearity, the scale separation between the fast wave oscillation and the slow non linear coupling among wave enables the development of an natural asymptotic theory. This theory is extremely elegant but its validity in real systems is still a matter of debate depending on the physical systems. I will briefly recall our experimental results on vibrated elastic plates and surface waves on water to show that this theory seems to fit (at least qualitatively) the observations. I will then discuss the relevance of this framework to internal waves and present the experiment that we plan to do in Grenoble in the framewaork of my ERC Grant on stratified (wave?) turbulence.

*Speaker