



CEA - Saclay 91191 Gif-sur-yvette Cedex
Service de Physique de l'Etat Condensé - UMR 3680

SÉMINAIRE

Mercredi 22 mars 2017 à 11h15

Orme des Merisiers SPEC, Salle Itzykson, Bât.774

Jérémie BEC

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Abrupt growth of large aggregates by correlated coalescences in turbulent flow

The time evolution of a population of aggregates undergoing coalescences is generally described by Smoluchowski's coagulation equation. This mean-field model is used in a number of situations going from polymerisation and flocculation to the growth of water droplets in clouds and planet formation. It relies on the assumption that successive collisions are uncorrelated.

We show that such an approach fails when the aggregates are diluted and suspended in a turbulent flow. The intermittency of turbulent transport accelerates the growth of large aggregates and is responsible for long-range correlations in the sequence of coalescences experienced by each individual particle. This new phenomena has important consequences on the macroscopic processes that are critically sensitive to the fast emergence of large aggregates, such as the formation of raindrops or planetary embryos.

A coffee break will be served at 11h00. The seminar will be given in English.
