



Séminaire PIMM

Jeudi 12 juin 2014 à 14 heures

Amphi Manet

Arts et Métiers ParisTech, 151 bd de l'hôpital, 75013 Paris

14h00

Izhak Bucher

Visiting prof. From Technion, Israel

SQUEEZED FILM BASED CONTROLLED ACOUSTIC LEVITATION OF OBJECTS

High frequency oscillations can create increased pressure in a surrounding gas when a flat object is placed in its vicinity. This physical phenomenon can 'hold in the air' weights up to 1kg at a distance of 1 to 100 micron. The phenomenon is most efficient when ultrasonic vibrations are induced, thus air's compressibility and viscosity play an important role. It is important to optimize the piezoelectric and mechanical structure that produce the necessary ultrasonic vibration.

The paper discusses several aspects of near-field acoustic levitation: structural dynamics optimization of mechanical vibration amplifiers, the effects of amplitude frequency a spatial vibration properties and the use of traveling waves to bring about in-plane propulsion of the levitated objects and the coupled structure-gas dynamics.

The author's group is carrying out a research funded by microelectronic manufacturers such as Intel In an attempt to produce non-contacting coverers of Silicon wafers. The role of acoustic levitation in these industries is to minimize the mechanical contact with Silicon wafers and the embedded electronic components such that no particles contamination takes place.

The paper incorporates theoretical, numerical, experimental results with an outlook to the remaining 3 years of these funded research.

A brief description of other research activities carried out in the authors laboratory will be described, including: use of traveling waves for micro-robotic swimmers and structural optimization of Micro-scale scanning mirrors.

14h45

Joseph Fitoussi

PIMM, groupe ArPe

CARACTERISATION ET MODELISATION MULTI-EHELLES DU COMPORTEMENT MECANIQUE DES COMPOSITES A MATRICE POLYMERE SOUMIS A DES SOLLICITATIONS DE "CRASH" ET DE FATIGUE.

15h30

Café