

SEMINAR 專題演講



## 國立中央大學 太空科學與工程學系

Department of Space Science and Engineering, National Central University

## Time

Tuesday , March 18, 2025 10:00 – 11:00

## Place

健雄館(科四館)

S4-917 教室 Room S4-917, Chien-Shiung Building

## Parametric resonance of Alfven waves driven by ionisation-recombination waves in the weakly ionised solar atmosphere

Dr. Istvan Ballai School of Mathematics and Statistics, University of Sheffield

In the fist part of my presentation I will summarise some findings on a new type of waves we found in partially ionised plasmas connected to the processes of ionisation and recombination.

Later I will speak about parametric coupling of waves as one of the most efficient mechanisms of energy transfer that can lead to the growth or decay of waves. This transfer occurs at frequencies close to their natural frequencies. In partially ionised solar plasma there are a multitude of waves that can undergo this process. In my presentation I will present results of a recent study on the parametric coupling of Alfven waves propagating in a partially ionised solar plasma with ionisation-recombination waves that appear in a plasma in ionisation non-equilibrium. Depending on the parameters that describe the plasma (density, temperature) the coupling can lead to a parametric resonance. Our study determines the occurrence conditions of parametric resonance, by finding the boundaries between stable and unstable regions in the parameter space. Our results show that collisions and non-equilibrium recombination can both contribute to the onset of unstable behaviour of parametrically resonant Alfven waves.