

Modulating magnetar emission by resonant cyclotron scattering

Thursday 11 May 2017 11:00 (30 minutes)

We present a new numerical tool to calculate the emission of highly magnetized neutron stars (magnetars) and apply it to describe the quasi-periodic oscillations (QPOs) observed in magnetar giant flares. In previous work we have developed a model of magneto-elastic oscillations of magnetars that allows to reproduce the observed frequencies. These QPOs can couple to the star's exterior through the magnetic field and induce currents in the magnetosphere that provide scattering targets for resonant cyclotron scattering of the photons. The scattering is calculated with a Monte-Carlo approach and it is coupled to a code that calculates the momentum distribution of the charge carriers as an one-dimensional accelerator problem. As a first test of the method we calculate the modulation of the quiescent emission of the neutron star by the magneto-elastic QPOs for a prescribed momentum distribution of the charge carriers.

Primary author: GABLER, Michael (Max Plank Institute for Astrophysics, Garching, Germany)

Presenter: GABLER, Michael (Max Plank Institute for Astrophysics, Garching, Germany)

Track Classification: SMFNS2017