Contribution ID: **11** Type: **not specified**

Oscillation symmetry applied to: 1) hadronic and nuclei masses and widths, and used to suggest unknown spins, 2) astrophysic

Monday, 11 June 2018 11:50 (20 minutes)

Like in classical physics (pendulum, spring, …), opposite interactions (potential and kinetic) generate oscillating behaviours in quantum physics. This is observed for masses resulting from Schr\"{o}dinger equations but also for widths of hadronic families and excited state nuclei masses.

The masses are ordered by increasing values, and the successive mass differences are plotted versus their corresponding mean masses. The widths are plotted versus the corresponding masses. The data are fitted using a simple cosine function.

The results will be shown, and used in some cases to suggest the spin of unknown spin particles. The variation of oscillating periods of meson and baryon families, exhibit regular behaviours between unflavoured mesons and N^* baryons in one side, between strange mesons and Λ baryons in the other side.

The same approach is performed to study the oscillation properties of the nuclei energy levels, and used to suggest the spin of some unknown level spins.

The astrophysical bodies are bound by two opposite forces, kinetic and gravitational. An oscillating symmetry is again observed between several properties. It will be illustrated by:
- solar planet moon diameters versus their distance from planets,
- milky way satellite galaxy brightnesses, masses, and diameters versus their distance fron earth,
- etc …..

This symmetry is used to tentatively predict the mass of the seventh's TRAPPIST-1 terrestrial planet, and also different properties of the hypothetical ninth and tenth solar planets, which masses are predicted to be close to ten times and half the earth mass.

Primary author: TATISCHEFF, Boris (CNRS IN2P3)

Presenter: TATISCHEFF, Boris (CNRS IN2P3)

Session Classification: Nuclear structure/reactions

Track Classification: Nuclear structure