Qiuhe Peng, J Astrophys Aerospace Technol 2018, Volume 6
DOI: 10.4172/2329-6542-C2-019

International Conference on
Planetary Science and Particle Physics
August 27-28, 2018 | Boston, USA

Qiuhe Peng

Nanjing University, China

Neutrino radiation by neutron superfluid vortex and its effects: Pulsar spin down and pulsar kicks

Our theory proposed in 1982 that decisive factor for spin down of pulsars with longer period ( ) is the neutrino radiation by neutron superfluid vortexes inside neutron stars has been confirmed by the recent observed ( ) diagram (2018) of pulsars which deviates seriously from the model of magnetic dipole radiation (the"standard model"). Based on the idea of the neutrino radiation by neutron superfluid vortexes, we proposed (at 2003) a gradual acceleration neutrino jet rocket model for pulsar kicks. The analysis based on the latest observational data published very recently for the 248 pulsars whose space velocities have already been determined reveals that pulsars probably are in a state of continuous acceleration. In other words, it is not very likely that the huge pulsar kicks are all received at once during a short period of time (less than a year) after their birth. Instead, the observed large kick velocities are probably gradually accumulated by continuous acceleration in a long period of time. On the basis of the neutrino emission from the superfluid vortexes in the neutron star interior, we propose a rocket model of neutrino jet for the gradual acceleration of pulsars. We have contributed acceleration scenario of pulsars with the different initial period. It is shown by the comparing the theory with the observation that our model is successful. By the neutron superfluid vortex model for pulsar kicks, we not only can explain naturally the continuous acceleration of the nascent pulsars but also can predict very nicely the huge natal kicks of neutron stars exceed 1000 Km/s. Addition to, the observed alignment of the pulsar kicks with their spinning axes may be interpreted as the most convincing astrophysical evidence for the subtle manifestation of parity non-conservation in the deep space outside of our solar system.

Biography

Qiuhe Peng is mainly engaged in Nuclear Astrophysics, Particle Astrophysics, and Galactic Astronomy research. In the field of Nuclear Astrophysics, his research project involved a neutron star (pulsar), the supernova explosion mechanism and the thermonuclear reaction inside the star, the synthesis of heavy elements and an interstellar radioactive element such as the origin of celestial 26Al. In addition, through his lectures, he establishes Nuclear Astrophysics research in China. He was invited by Peking University, by Tsinghua University (both in Beijing and in Taiwan) and by Nuclear Physics institutes in Beijing, Shanghai, Lanzhou to give lectures on Nuclear Astrophysics many times. He has participated in the international academic conferences over 40 times and he visited more than 20 countries. In 1994, he visited eight institutes in the USA to give lectures. He is the first Chinese Astrophysicist to visit NASA and to give a lecture on the topic, "Nuclear Synthesis of Interstellar 26Al". In 2005, he visited the USA twice and gave lectures in eight universities again. Inviting six astronomers of USA to give series lectures, he has hosted four consecutive terms summer school on gravitational wave astronomy. After the four-summer school obvious effect, at least 20 young scholars in China in the field of gravitational wave astronomy specialized learning and research. 220 research papers by him have been published.

qhpeng@nju.edu.cn

Notes: