



3rd Asia-Pacific Conference on Plasma Physics, 4-8,11.2019, Hefei, China

Optimization of deuteron beam yield in a low-energy dense plasma focus device

Seong Ling Yap¹, Lian Kuang Lim¹, Seong Shan Yap², --- (times 12pt)

¹ Department of physics, Faculty of Science, University of Malaya, ²Faculty of Engineering,
Multimedia University, Malaysia

e-mail (speaker): yapsl@um.edu.my

A low energy dense plasma focus (DPF) device typically designed to operate at pressure of several minibar for neutron generation often produced multiple pulsed radiations including neutrons, ion and electron beam, soft and hard X-ray and sometime gamma radiation. This powerful pinch of very high temperature and high density are primarily driven by the electromagnetic acceleration and compression. The pinch dynamic and broad spectrum emissions poses a large range of complex physical phenomena. The plasma pinch serves as the reactor of the emission and its energy is dissipated through the different mechanisms leading to the emissions. In contrast to optimized pinch that favor broad spectrum emission, this work attempt to optimize the device for deuteron beam yield. The electrode have been lengthen to provide an inductive storage to the discharge energy before the current sheath collapse. Synchronized formation of current sheath from back wall is assisted by pre-ionization, that allow the filled pressure to be lowered to match the discharge current characteristics. Reproducible pinch is observed with large current pumped into the pinch. Anomalous resistivity is measured as the dominating factor during the pinch phase and responsible for the deuteron beam acceleration. Enhanced deuteron beam yield of more than 50% has been obtained.

References

The references related to your talks will be used to write summary paper in RMPP (Rev. Mod. Plasma Phys.). So do not miss important papers related to your talk.

Figure xx

Note: Abstract should be in 1 page.