عنوان مقاله:

Characterization and Passive Spectrometry of Pulsed X-rayEmission From ۵kJ Plasma Focus Device

محل انتشار:

هفتمین کنفرانس بین المللی فیزیک، ریاضی و توسعه علوم پایه (سال: 1402)

تعداد صفحات اصل مقاله: 9

نویسندگان:

Noushin Pishbin - *Plasma and Nuclear Fusion Research School, Nuclear Science and Technology Research Institute, AtomicEnergy Organization, Tehran, Iran*

Maryam Akbari Nasaji - *Plasma and Nuclear Fusion Research School, Nuclear Science and Technology Research Institute, AtomicEnergy Organization, Tehran, Iran*

Dariush Rostamifard - *Plasma and Nuclear Fusion Research School, Nuclear Science and Technology Research Institute, AtomicEnergy Organization, Tehran, Iran*

Ali Nasiri - *Plasma and Nuclear Fusion Research School, Nuclear Science and Technology Research Institute, AtomicEnergy Organization, Tehran, Iran*

Mahsa Moazzemi Ghamsari - *Advanced Technologies Inc, Atomic Energy Organization, Tehran, Iran*

خلاصه مقاله:

The results of the investigation of the radiation emission X-ray from a ۵ kJ Mather Type Plasma Focus(MTPF۰۵) operated in argon are presented. The charging voltage was ۱۲ kV and the operating pressure wasin the range of ۰.۲–۰.۷ torr. Several diagnostics techniques such as Rogowski coil, five-channel PIN diodeand scintillator–photomultiplier were employed during the project. The signals obtained from the detectorswere analyzed using MATLAB software. The pressure ۰.۳ torr of argon was found to give maximum X-rayyield. In the following, the passive spectroscopy method, using radiographic film with Al attenuation filters,was used to determine the spectrum of pulsed X-ray emitted from the MTPF۰۵. In order to determine thespectrum according to the recorded doses, solving linear equations was used. The results showed when theMTPF۰۵ device is operated by working voltage of ۱۲ kV and ۰.۳ torr argon gas injection, the X-ray spectrumextends from ۱۰ keV to ۲۵۰ keV with a maximum of ۱۲۰ keV. A reliable low-energy plasma focus device withX-ray emission could be used as an X-ray source in various technological fields

کلمات کلیدی:

Plasma Focus Device, X- ray- passive spectroscopy method