

P2.3019 Electrode design for X-ray lithography fast shutter speed

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See full abstract here:

<http://ocs.ciemat.es/EPS2019ABS/pdf/P2.3019.pdf>

Advantages of X-ray which is emitted by dense plasma focus (DPF) are high-speed shutter and high energy. It can be used as a tool for researching on the property and structure of an object with high speed movement such as turbine blade. This is the target research for Thailand Plasma 1 (TPF-1). The X-ray yield strongly depends on a pinch current (I_{pinch}), that is ~ 4 . In this work, Lee code is used to calculate the parameters of plasma focus in order to optimize the TPF-1 electrodes; anode radius (a), cathode radius (b) and electrodes length (z) for Argon or Neon as a working gas. The optimized electrode radii are $a = 1.88$ cm and $b = 2.25$ cm. The optimized electrode length depends on the filling gas, 5.2 cm and 3.5 cm for Neon and Argon, respectively. The important parameters of plasma focus consisting of pinch current, pinch temperature and pinch duration are calculated. Their values are 99.5 kA, 3.2×10^5 K and 30.8 ns for Neon gas and 99.5 kA, 1.9×10^5 K and 42.0 ns for Argon gas, respectively.

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