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Calculate Argon Plasma Density Generate by UNU/ICTP Plasma Focus Device

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A plasma focus (PF) device is device to generate plasma which is applied in ion acceleration, material surface modification and fusion reaction source. For plasma fusion is interest topic to study. Calculating plasma parameters such as plasma density and plasma temperature is importance to find the optimum condition for their applications. In this research uses Lee model code to calculate the plasma parameters under the 3.3 kJ UNU/ICTP configurations, and the operating pressure is 1.0 mbar, 1.5 mbar, and 2.0 mbar. These parameters were predicted at the position 7 cm, 9 cm, 11 cm and 13 cm respectively. From the results, plasma temperature are between 1.57×10^5 to 4.50×10^5 K and plasma density are between 2.11 – 7.55 g/m³. The results are shown that the density is depended directly with the operating pressure, but the plasma temperature is depended inversely with the pressure. The dynamics of plasma is affected by Lorentz force is causes of these results because both the plasma temperature and plasma density in each position varied with this force directly. The further work, studying the plasma dynamics must be included collision between particles in the plasma that is close to the real phenomena.

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