

## **The field distribution of a symmetric surface wave in a non-isothermal plasma in a co-axial structure**

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The electric and magnetic field profiles of azimuthally symmetric surface waves (SWs) in diffusion-controlled regime of a non-isothermal plasma in a co-axial structure are investigated. The geometry of waveguide used in this work, consisted of a central coaxial hollow metallic cylinder with radius  $a$ , around which there was a plasma column surrounded by a quartz tube with inner radius  $b > a$ . This system was located in the cylindrical metal waveguide with radius  $d > b$  as a coaxial waveguide. The interface media between the quartz and metal wall was air or vacuum. A microwave surfaguide generator at 2.45 GHz was used to produce and sustain the plasma. For a non-magnetic plasma column with the cylindrical symmetry, the SWs are often Etype with field components  $E_z$ ,  $E_r$  and  $B_\phi$  if the axis of symmetry is directed along the  $z$  axis<sup>1</sup>. The SW produced plasma is applied in plasma technologies. The influence of some physical parameters such as SW frequency, the electron density and other parameters is investigated on the radial field profiles in a plasma column.

1. B. Shokri and A. R. Niknam, "Field profiles of symmetric surface waves in diffusion-controlled regime of a nonisothermal plasma columns" *Plasma Phys. Control. Fusion*, 47, 2005, pp 1805-1816.