

(It is still unclear what is the meaning of z_0 in formula (4). The boundary condition (4) should be stated on the free surface $z=\eta(x,y,t)$ but not at $z=z_0$.

I suggest to the author to replace $|z_0$ in (4) by the phrase "at the interface".)

Yes, we mean that, the boundary conditions at the interface between plasma and vacuum, which have done in Eq. (4).

$$\left(\frac{\partial}{\partial t} + u_x \frac{\partial}{\partial x} + u_y \frac{\partial}{\partial y}\right) \eta = u_z \Big|_{\text{at the interface}} \quad (4)$$

Above Eqs. (7) and (8) it clear that, this conditions at the interface, where in the manuscript, one can see that,

The dynamic boundary condition across the interface of plasma-vacuum is

$$\langle P_s \rangle = \langle \frac{B^2}{\mu} \rangle, \quad (7)$$

the brackets $\langle \rangle$ is the jump across the interface, P_s the pressure through the two layers and μ is magnetic permeability.

The condition on the magnetic field at the interface with a perfect conductor is

$$\vec{n} \cdot \vec{B} = \vec{n} \cdot \nabla \varphi = 0, \quad (8)$$