

# Effect of Ionization Ratio of Two Species of Positive Ions on Magnetized Plasma Sheath

Kumar Khadka <sup>a)</sup> and Raju Khanal <sup>b)</sup>

*Central Department of Physics, Tribhuvan University, Kirtipur, Kathmandu, Nepal*

<sup>a)</sup>Corresponding author: kumarkhadka82@yahoo.com

<sup>b)</sup> plasmanepal@hotmail.com

**Abstract.** Study of multi-component magnetized plasma sheath at different ionization ratio has special importance in material surface treatment, etching, thin-film deposition, secondary electron emission guns and ion implantation. The effect of ionization ratio on multi-component magnetized plasma sheath has been studied using fluid model. The normalized fluid equations are solved numerically to analyze the density, velocity and potential profiles of ions. The plasma considered has two species of non-isothermal positive ions (Helium and Argon) with different ionization ratio. The results show that the density decreases with increasing value of ionization ratio and it is interesting to note that the charge of lighter ion species has the dominating effect on density profiles of both ions. Also the density peak becomes sharper and shifts towards the sheath edge as the charge number is increased. Unequal temperature of ions results in prominent ripples on bump and depression of density and velocity profiles of lighter ion. Furthermore, sheath potential increases with increasing value of the ionization ratio.