

Review on angeo-2022-30

The paper proposes a method to derive the bow shock characteristics from magnetic field measurements only. Unfortunately, the proposed method does not work. Rankine-Hugoniot relations give the function

$$R = R(M, \theta, \beta) \tag{1}$$

where $R = B_d/B_u$ and the rest of the parameters are defined in the paper. Inverting, one has

$$M = M(R, \theta, \beta) \tag{2}$$

Assuming the both R and θ can be obtained from the magnetic field measurements only, there is still dependence on β , which requires particle measurements. This dependence could be ignored if weak. Figure 1 upper panel shows that this assumption is not correct. Even more important, Figure 1 shows that the Mach number is extremely sensitive to the value of the shock angle. The latter is not measured with the precision of 0.5° .