

### 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

$$R = R(M, \theta, \beta) \quad (1)$$

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

$$M = M(R, \theta, \beta) \quad (2)$$

Assuming the both  $R$  and  $\theta$  can be obtained from the magnetic field measurements only, there is still dependence on  $\beta$ , 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  $0.5^\circ$ .