Abstract Submitted
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**Double layer and thrust**[1] AMNON FRUCHTMAN, Holon Academic Institute of Technology — It is shown that the net momentum delivered by the possibly large electric fields inside a double layer is zero. The total particle momentum is the same while the momentum partitioning between the various species is different on both sides of the layer. The momentum balance is demonstrated schematically for the double layer at the boundary of the ionosphere and the aurora. Implications for plasma accelerators are discussed, in particular for the recently observed acceleration to supersonic velocities by a double layer at the exit of a helicon source [1]. It is shown that a double layer can be formed by both area expansion [2] and neutral density decay[3]. The plasma acceleration is shown to be a result of an efficient conversion of plasma pressure to thrust.

1. C. Charles and R. Boswell, Appl. Phys. Lett. **82**, 1356 (2003); S. A. Cohen *et al.*, Phys. Plasmas **10**, 2593 (2003).

2. W. M. Manheimer, IEEE Trans. Plasma Sci. **29**. 75 (2001).

3. A. Meige *et al.*, Phys. Plasma **12**, 052317 (2005).

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