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Interactive comment on "Dynamics Geomagnetic Storm on 7–10 September 2015 as Observed by TWINS and Simulated by CIMI" *by* Joseph D. Perez et al.

Anonymous Referee #1

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The authors now present the meaning of the equatorial pressure p_{eq} as $p_{eq} = \frac{2\pi}{m} \int E f de$, where m is mass, E is energy, and f is the number of ions per unit area, energy and steradian. First of all, I am unsure if f corresponds to the so-called differential number flux that is the number of ions per unit area, energy, time and steradian. If so, I have further comment.

The definition of the perpendicular and parallel pressure ($P_\perp$ and $P_{||}$) is as follows. $P_\perp = \frac{1}{2}\int mv^2 \sin^2\alpha F d\mathbf{v}$ and $P_{||} = \int mv^2 \cos^2\alpha F d\mathbf{v}$, where F is the velocity distribution function. These equations can be derived from the original definition of pressure (probably Braginskii (1965) provided, too). Lui

et al. (1987) also present these equations. The velocity distribution function is given by $F = \frac{m}{v^2} f$. Substituting this into above equations, I have $P_\perp = \int\int \pi\sqrt{2m} f \sqrt{E} \sin^2\alpha d(\cos\alpha) dE = \int\int \pi\sqrt{2m} f \sqrt{E} dE \sin^2\alpha d(\cos\alpha) = \int p_{eq} \sin^2\alpha d(\cos\alpha)$ and $P_{||} = \int\int 2\pi\sqrt{2m} f \sqrt{E} \cos^2\alpha d(\cos\alpha) dE = \int 2p_{eq} \cos^2\alpha d(\cos\alpha)$, where $p_{eq} = \int \pi\sqrt{2m} f \sqrt{E} dE$. It seems that the definition of p_{eq} is different from the authors'. The same equation is found in Eqs (7) and (8) in De Michelis et al. (1997, doi:10.1029/96JA03743).

Maybe I misunderstand, but I would like to make it clear.

I suggest avoiding the term 'equatorial pressure' because this term is confusing and misleading. The above equations can be applied for everywhere, not restricted in the equatorial plane.

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