Abstract Submitted
for the APR20 Meeting of
The American Physical Society

Observations of Interstellar Atomic Species by the Magnetospheric Multiscale Mission (MMS) ROMAN GOMEZ, STEPHEN FUSELIER, JAMES BURCH, JOEY MUKHERJEE, CARRIE GONZALEZ, Southwest Research Institute — A constant neutral wind of interstellar material, mostly hydrogen, constantly enters the heliosphere at a velocity of 26 km/s as a consequence of the Sun's motion relative to the local interstellar medium (LISM). Neutral atoms in the heliosphere are solely under the influence of the gravity and radiation pressure which both increase inversely as r^2 (where r is the heliocentric distance). With decreasing distance, the gravitational influence of the Sun causes the formation of focusing cones for species more massive than hydrogen, i.e. regions of enhanced density on the downwind side of the Sun. The increased density leads to a higher probability of ionization which makes these newly born ions visible to plasma instruments of in the vicinity of the cone. For hydrogen atoms, gravity and radiation pressure essentially balance out. In addition, the higher ionization rates of hydrogen relative to other ion species leads to the formation of an interstellar neutral (ISN) hydrogen cavity upwind and downwind of the Sun. It is thought that during solar minima that observation of interstellar hydrogen ions will also be possible. In this work is presented interstellar hydrogen observations as well as sequential annual surveys of the helium focusing cone by the plasma instrument of the MMS mission.

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Date submitted: 03 Dec 2019 Electronic form version 1.4